EDITORIAL NOTES.

In this issue will be found an outline of the program for the annual meeting of the State Society, which will be held at the **STATE SOCIETY PROGRAM.** Hotel Vendome, San Jose, the Tuesday, Wednesday and Thursday of the third week in April—the 20th, 21st and 22nd. The Public Health Association will, as usual, meet on Monday, April 19th, and a program of unusual interest is promised, though, at the time of writing, the details are not ready for publication. It will be noted that there are some unusual and interesting features connected with this coming annual meeting of our Society. A special effort has been made by the Committee on Scientific Program (and much credit is due the Chairman of that Committee, Dr. Martin Fischer) to secure an elaborate and instructive scientific exhibit with a certain amount of time set aside for demonstrating and lecturing upon some of the more notable exhibits. This is quite a new thing with us (though it has been a feature of the A. M. A. meetings for the last few years) and it should prove both interesting and profitable in a high degree. The symposium plan, which was found so acceptable, in the last two years, is continued and will be found of great interest. All papers are to be strictly limited in length and the President, Dr. Beckett, announces that he will rigidly enforce the time limit on readers of papers and the discussers thereof. It is to be hoped that every County Medical Society will be well represented at this meeting; there is no physician in the State who would not be helped and benefited by attending the meeting and participating in the work. And by just so much as he is helped, his patients are benefited and the community gains. Therefore, let every one of our members take heed for his time and to his affairs and make the greatest effort to attend this meeting. Let us have the biggest and best meeting on record.

The Rev. Mr. Worcester, rector of the Emmanuel Church, in Boston, has recently been in our **EMMANUEL MOVEMENT.** State and has attracted a good deal of attention to what is now known as the "Emmanuel Movement." A number of medical journals have recently contained a good deal of matter anent this subject, pro and con. On January 25th, Mr. Worcester addressed a meeting of clergymen and physicians at the St. Francis Hotel, San Francisco, and on the night of the 26th he addressed a public meeting, in the same city, where the attendance as reported by the press, was between six and eight thousand. We have here "a condition and not a theory." The keynote of the "movement" as given by Mr. Worcester, is that no persons shall be treated by the clergy engaging in this endeavor unless said persons shall be under the charge of a physician who recommends that the treatment by the clergy be employed. In the *Journal A. M. A.* for January 23rd is a letter signed by Drs. Goldthwait, Mumford, Cabot and Pratt, of Boston, outlining the rules set down for carrying on the work and for the guidance of the clergy and the physicians. No person may be accepted for treatment at Emmanuel Church unless so recommended by his physician; if he applies and has no physician, he is referred to one for examination before his treatment will be undertaken by the ministers. That is all very well and as it should be. But there are ministers and ministers, just as there are doctors and doctors. The public mind is simple; when six to eight thousand people gather to listen to this new "gospel of health," the vast majority of them are not going to appreciate the facts as set forth; they are going to regard the preachment as a new cure for the particular thing which they happen to have—be it tuberculosis or a broken leg. Furthermore, while the clergy of Emmanuel Church, and of other duly authorized churches may abide by the rules placing their work under medical guidance, who is to prevent any unscrupulous minister (and, alas! there are some such) from starting an "Emmanuel movement" shop of his own? The good that may have been done or that may be done to-day is not criticized; the possibilities of another form of charlatanry must not be overlooked. There has always been a subtle relation between medical vagaries and the ministry; it is said on good authority that a very large percentage of the notorious quacks in the United States are broken down or unfrocked clergymen. Facts are facts and the elemental type of the average human mind is one of them that can not be ignored. Within a year we shall hear of more than one unauthorized "Emmanuel movement" shop.

The Tuberculosis Committee of the State Medical Society has had prepared and introduced into the Legislature, two bills relating **BILLS ON TUBERCULOSIS.** to tuberculosis. One, Senate Bill No. 63, creates a Tuberculosis Commission of seven members and appropriates $5,000.00 for carrying on a careful study of tuberculosis as it is found to exist in this State. The Commission is to study the records of all hospitals, dispensaries or other institutions and compile their records so far as these relate to tuberculosis. It is also to study and report the relation of tuberculosis to the general public health of the State. It seems to be an excellent bill and our members should use their influence to secure its passage.* In discussing the matter in com-

* This bill has been withdrawn on account of the objections stated.—Ed.

mittee, some of the Senators were of the opinion that the work should be in the hands of the State Board of Health, which argument is strangely in line with the general argument in the last issue of the JOURNAL. But the State Board of Health, as at present equipped by law, has at least as much work as it can do; it should have more funds and more machinery at its disposal and then it could undertake such side issues as the present investigation and study of conditions relating to tuberculosis. The other bill, Senate No. 59, relates to the reporting of cases of tuberculosis and seems to have got around the objections which have, heretofore, been urged against compulsory notification. It declares that "tuberculosis is an infectious and communicable disease" and as such is to be reported. It provides for the disinfection of premises after the death of a tuberculotic therein; it provides for the careful recording of all information relating to cases of tuberculosis that would in time be of inestimable value. It is a good bill and should receive our united support. The wave of popular approval of the fight against tuberculosis should be utilized by us as a means of floating into the statute books some good legislation for the benefit of the people. Urge upon your representatives the passage of these bills.

The printing office at Sacramento was a little slow at getting started when the Legislature began legislating, and consequently **ABOUT BILLS MEDICAL.** the various bills relating to the practice of medicine had not been ground out at the time the last number of the JOURNAL went to press. Now, however, we are able to present an analysis of those which are most important. Of course there is a bill to create a board of examiners in Naturopathy, that peculiar and not understandable cult which flourishes mostly on the sea coast near Los Angeles. Then there is a vicious bill which is an exact copy of our present law except that it licenses all the practitioners of "chiropractic" now in the State and so would license an unknown number of quacks.

The prize freak of the collection is a bill said to have emanated from the College of P. & S., San Francisco, though this may be an idle rumor. It is a wonder! It creates a Medical Council of 23 members and gives them unlimited authority to do anything they wish from licensing physicians without examination to playing the races. It provides a tax of $5.00 a year on all physicians and if they don't pay up promptly they lose their licenses. This tax, together with the large fees for examinations, would create an income of about $50,000.00 a year, the which the Council may expend in any way that it sees fit; there are absolutely no strings upon the expenditure of the money. The San Francisco *Chronicle* published an article in which it suggested that the purpose of this bill was to provide funds for the purchase, from the present owners, Dr. Winslow Anderson, et al. (including Dr. Boxton, the ex-boodling Supervisor of San Francisco?) of the College of Physicians and Surgeons of San Francisco. This may be a canard, but it is known that the College referred to was for sale a few months ago and it certainly looks suspicious. Still another bill has been drawn up, though, at the time of writing, it has not been introduced. It has some things to commend it but much that is very bad. It allows the Governor to appoint the board without any limitations in the nature of nominations from the various societies. It establishes reciprocity with all States (which would return unto—or upon—us 80% of those rejected by our examinations); it fixes an arbitrary standard of education instead of having the flexible standard as now provided—and the Supreme Court says the present arrangement is wise as the details of education are constantly changing.

Some county societies have already passed resolutions endorsing Dr. N. K. Foster as Secretary of the State Board of Health and re**DOCTOR FOSTER.** questing his reappointment by the Governor when his term expires in April. All societies should do this before that time and should send the resolutions to the Governor. Furthermore, individual members who know the Governor (or if they do not know him) should write at once and urge this reappointment. Dr. Foster has done more than any other single individual in the State, to make the State Board of Health a real power for the good of the people and the betterment of public health conditions. His retirement from the work that he has thus far performed with remarkable ability and tact, would be in the nature of a calamity. Of untiring energy, calm judgment, with a broad grasp of conditions and no mistaken ideas as to what things are possible and what things are impracticable, he has fulfilled the duties of his office in a way to attract the attention of anyone giving a moment's thought to public health matters. By all means urge the Governor to reappoint Dr. N. K. Foster and let him know that the entire medical profession of the State approves of Dr. Foster and regards him as a man most valuable to the people.

NOTICE!

FORTIETH ANNUAL MEETING

Medical Society, State of California

WRITE TO THE HOTEL VENDOME AT ONCE AND SECURE RESERVATION.

WHEN YOU BUY YOUR TICKET TO SAN JOSE, GET A RE-CEIPT - CERTIFICATE FROM THE AGENT. WHEN YOU RE-TURN, YOU WILL HAVE TO PAY ONE-THIRD FARE.

THIS IS THE CUSTOMARY ARRANGEMENT.

HERE FOLLOWS AN OUTLINE OF THE PROGRAM:

April 20, 21 and 22, 1909.

Except for details, the Scientific program for the next meeting of the State Society is complete. The general arrangement of the program is about as follows:

During the morning session of the first day the President will deliver his address, and the Chairmen of the various committees will report.

The afternoon of the first day will be devoted to sectional meetings. The Eye, Ear, Nose and Throat Section will have a symposium on Chronic Suppurative Otitis Media. Drs. Moffitt, Fredericks, Hulen, Sewall, Welty (San Francisco), Wintermute (Berkeley), Hibbard, Fleming and Ellis (Los Angeles), will read papers on the medical and surgical aspects of the subject.

The discussion of these papers will be opened by Drs. Bine, Payne, Pischel (San Francisco); Trowbridge (Fresno); Powell (Stockton); Thomas, Clarke (Oakland); Hastings and Macleish (Los Angeles).

The joint meeting with the Pacific Coast Branch of the American Urological Association held during the same hours will consider Urinary Tuberculosis.

The afternoon of the second day will be devoted to the scientific exhibit. While this will be open during the entire session, special demonstrations are planned for this afternoon. Dr. Ryfkogel (San Francisco) will make a surgical demonstration. Dr. Brumwell (King City) will exhibit a dissection. Drs. Painter (San Francisco) and Wilbur (Palo Alto) will exhibit X-Ray apparatus and plates. Dr.

Garrey and assistants (San Francisco) will make a physiological exhibit, and Drs. Leonard, Black (Los Angeles), Moore (Oakland), Gillihan (Berkeley), and Wherry will show some pathological specimens.

During the morning of the second day, and during both sessions of the third day, medical and surgical papers will be presented by the following: Drs. Burnham, Clark and Newman (San Diego); Drs. King, Soiland, Richardson, Cole, Miller, Martin, Leonard, Barlow, Stookey, Edwards, and MacGowan (Los Angeles); Drs. Sherk and Roberts (Pasadena); Dr. Ball (Santa Ana); Drs. Moseley and Hoey (Redlands); Dr. Evans (Highlands); Dr. King (Banning); Dr. Thomas (Claremont); Dr. Roblee (Riverside); Drs. Barry and Brown (Santa Barbara); Dr. Bering (Tulare); Dr. Wilbur (Palo Alto); Dr. Pope (Watsonville); Dr. Edwards (Salinas City); Dr. Clark (San Leandro); Dr. Blair (San Jose); Dr. Hogan (Vallejo); Drs. Brown, Rothschild, Porter, Cooper, Tait, Russ, Spaulding, Levison, Barbat and Hunkin (San Francisco).

As last year, the reading of the individual papers may not take more than ten minutes. Adherence to this rule is urged upon the contributors not as a hardship, but in the interests of a rapidly moving and good program. Those who question the wisdom of so restricted a time are asked to recall the disastrous results which, in every instance, followed infraction of this rule at the Coronado Meeting last year. As heretofore, no limit is placed upon the length of the published paper.

A good many County Medical Society Secretaries do not seem to realize the importance of their position. On the County Secretary really depends the whole success or failure of the County Society, and on the County Society is founded the whole structure of medical organization—the State Society and the American Medical Association. The good that these organizations are doing in California and in the whole United States, is incalculable. Most of us do not seem to realize a tithe of the work that is really being done for the betterment of our profession and the consequent further protection of the people. In our own State, consider the difference between the attitude of the average legislator now, and the same individual a few years ago when we were a heterogeneous body of disorganized individuals, not in touch with each other, not knowing what was going on in other parts of the State; not even knowing what should be done for the people nor agreeing amongst ourselves upon anything. Now it is quite different. Physicians in the far North are informed of what is being done by those in the far South. Definite policies are outlined and a large number of widely separated individuals are in close touch in connection with these policies; they inform their own respective legislators *why* certain things should be done, and *why* certain other things should not be done, and in many instances they do this either before the representative is elected, or before the Legislature has assembled. So, too, with the American Medical Association, which is made up of the various State Societies. It is doing a magnificent work in bringing together physicians from all parts of the country and in unifying our efforts to improve things within our profession and thus help the people whose servants we are, toward the securing for themselves better medical attendance.

COUNTY SECRETARIES.

Thus, for example, the Council on Medical Education, of the American Medical Association, has done more to raise the standards of medical schools, bring about the consolidation of some and put to shame others, than anything that has ever been done in this country heretofore. And working with the Council on Medical Education is the Directory Department of the A. M. A. itself. The amount of most valuable work that is here being done is almost unbelievable. A record is made of all graduates from all schools in the country, and where these graduates are licensed; and this record is kept up to date and carefully stored in fire-proof vaults. Of course the gathering of all this information began with the undertaking by the A. M. A. of the publication of a reliable directory of physicians—something that had never been done previously. It was soon evident that it would be necessary to accumulate a vast store of information in excess of that which actually gets into the published book. Many states have always been careless in the matter of keeping records of graduates and licentiates. Furthermore, nowhere

COUNCIL ON EDUCATION.

in the United States was there assembled a complete list of all graduates of all schools and so questions of doubtful record could not be settled except at an enormous expense of time and energy. Now this information is assembled in one safe place and at any time, in a few seconds, the identity of the individual, his place of graduation and much of his history may be ascertained. It is almost impossible to overestimate the value of this work to the medical profession, and, of course, incidentally to the people. And this is just one part of the great work that the A. M. A. is doing for all of us—and is able to do because of the existence of medical organization and of County Medical Societies.

REVIEW OF THE WORK DONE IN THE ANATOMICAL DEPARTMENT OF COOPER MEDICAL COLLEGE.*

By F. E. BLAISDELL, M. D., San Francisco.

Realizing the great importance of anatomy in the study of medicine and surgery, every effort has been made to improve the course of anatomical instruction during the last few years. The improvement has been gradual in the several branches. The work of the teachers and students has been systematized and a spirit of earnestness has been developed and maintained throughout. Careful watchfulness on the part of the teachers as to the quantity and quality of work done by the students has eliminated largely the tendency to do superficial work, and made it impossible to neglect and at the same time receive credit for work which was not done.

There has been greater companionship between the teachers and students. The latter have been constantly followed in their work, encouraged and criticized when necessary and always guided onwards to the accomplishment of laudatory work; as a result a feeling of pride has been engendered, which has had the result of making the student look upon the dissecting room as a resort for earnest work and discussion.

The improvement could have been more rapid and maintained more thoroughly, had it been possible to retain experienced teachers. Usually when an instructor had gained sufficient experience to become truly valuable, work in some other field with greater remuneration called him away and a new and less experienced teacher would have to take his place. This intermittent value of teachers has had a retarding influence upon ideal work.

The conduct of the students has been considerably better in the last two or three years. This no doubt is partly due to the fines imposed for all grievous breach of the rules with destruction of property.

Realizing that lack of promptness on the part of teachers had considerable to do with outbreaks of riotous demonstrations, an effort has been made by the teachers to be a few minutes early.

Disregard of teachers for rules of the college, in the presence of students, has had a demoralizing effect upon the moral control of them. The teach-

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* Read before the Cooper College Science Club.

ers in my department have been cautioned to maintain rigid regard for prohibitory rules.

It is the custom to study the personality, moral and intellectual status of each and every student and to deal with him according to his own merits —to encourage the slow, to hold back the too rapid and superficial worker, to advise and restrain the over-eager; to criticize and reprimand those who ignore advice. To at all times diffuse enthusiasm for the study of anatomy, to promote conversation and discussion, ignoring topics not anatomical in the class room. Never to condemn a part or tissue of the body—not even the *os sphenoidale* *"damnatum,"* but to portray its beauties and wonderful adaptation to its Atlantian task of forming the cranial base, the keystone of the arch as it were, and offering such an interesting array of foramina for the transmission of important nerves and vessels. To at all times arouse interest and to guide the student into the line of independent power of observation.

The technical terms, the *bete noir* of most students, have been discussed etymologically and compared with the common English terms, the former being but the Latin translation of the latter and really easy to master.

While the efforts of the department's teachers have not been as perfect as they should, the cornerstone has been laid and the road indicated for future and greater work.

Besides moral encouragement, the department recognizes the responsibilities resting upon it to supply proper material for dissection and demonstration. For, to see and to form mental images of the various parts of the human body, is an indispensable aid in acquiring the material for future recollection and work in after life. While a teacher and text books are but guides, the individual students must dissect out, handle, see and feel the structures of the human body. Not only to see them once, but over and over again, to reiterate, and with each review to see new details and relationships.

A person, to be a true student and investigator, must let the mentality of the ego have complete control of the physical body, so that laziness, procrastination, and weariness of monotony will find no resting place, and a headache will be forgotten in the presence of new facts, where persistency of purpose prevails.

A few years ago anatomical material was not plentiful. At present some 70 cadavers are kept on hand in wooden tanks. The embalming is excellent for dissecting purposes and the cadavers will keep a year or more in the tanks and never putrify upon the dissecting table, but on the contrary mummify. No disagreeable odor permeates the dissecting room and in case of cuts upon the hand, infection rarely occurs.

While for dissection purposes the material is almost ideal, the effect of the alcohol and carbolic acid used in the embalming process stiffens the organs and extremities and renders surgical and gynecological demonstrations upon the cadaver more or less unsatisfactory. For the past year experiments to discover new methods have been tried in order to find some manner of having the muscles soft and of natural color and the articulations flexible so that abduction, adduction and flexure of the extremities could be easily accomplished. The results of the investigations still in progress have been varied.

The starting of a bone collection for teaching purposes and also for osteological research in the variation of the bones of different bodies, is a feature now being developed.

Preserved dissections, hardened brains of different species of animals for comparative work are being accumulated. Embryological serial sections and normal tissue sections are being gradually acquired to constitute embryological and histological libraries.

The course of the anatomical department, as given in the college announcement, is no doubt familiar to you all, so I shall now simply confine myself to the intrinsic facts of the class room.

The classes do not now have to listen to the teacher as he monotonously lectures, for the students are made to do the talking while the teacher listens, each student is wide awake and follows his classmate in his recitation.

The instruction in osteology, arthrology and myology is conducted in this manner, with the bones, dissected joints, ligaments and cadaver at hand for the students to demonstrate facts as they state them. They learn to see, feel and handle the structures. The text book has performed its function in supplying the student with his first knowledge of the bone, joint or muscle, but now the students lecture to the teacher, who simply corrects mistakes or criticizes and emphasizes important points. These recitations involve all the details of the object under consideration. The anatomy of the sophomore year is taught in the same way.

Bone modeling for six hours a week for two months in the freshman year, gives an excellent opportunity to observe how the latent possibilities in the student can be aroused or brought out.

From a block of clay the student gradually develops a model, of the same size with all the details as are to be observed on the original and natural bone. His attention is attracted to the details and he is face to face with the three dimensions, and the whys and wherefores come to his mind as interrogatives. This is a golden opportunity for the teacher to study each student and to form an idea of his weak and strong points in powers of observation and artistic ability. When the model is finished the student lectures to the teacher on the model, pointing out the facts and details as he previously did on the natural bone, which he has on hand to compare with his model. This test is passed before he receives credit for his work.

After the freshmen have modeled all of the most important bones, some 20 in number, they enter the dissecting room to begin work there. Five students are assigned to a cadaver, and each is required to keep the part he is to work upon neatly

wrapped in muslin bandages. If the part be a lower upon which he is to work, he is first assigned the superficial structures of the anterior abdominal wall. This work is outlined according to Barker's Manual. The integument first receives his attention, he reads it up in the text book and also learns that immediately beneath it is the superficial fascia, and beneath that the deep fascia. He now studies the lines for incising the integument which he reflects, then begins to search out the superficial nerves, blood vessels and lymphatics, which he traces to the deep fascia if they pierce it in the region upon which he is working, if not, then they are traced to the limits of the region. After these structures are all cleaned and the superficial fascia reflected and an independent knowledge is gained of all the structures exposed, he takes his first or superficial quiz. If this proves satisfactory to the instructor, the student is allowed to give his attention to the deeper structures; if not, he must review his work and give another demonstration and recitation.

The second quiz includes all of the structures in the anterior abdominal wall down to the peritoneum. This also includes the surgical anatomy of inguinal hernia, anastomoses, etc. In fact, this second quiz involves everything in that region. The teacher searches out what the student has overlooked or does not understand, and explains and demonstrates it to him. The student must review his work if the recitation falls below 75%.

The student may have to answer 50 to 100 questions, it all depends upon how well he can carry on a demonstration and recitation without being prompted by questions. A quiz may consume an hour's time.

To still further illustrate how the anatomical instruction is carried out, I will say that the first quiz on the abdominal and thoracic cavities does not require dissection, except in the thorax the sternum has to be removed after work on the anterior thoracic wall; the anterior mediastinum and superficial part of the superior are dissected out so as to reveal the pericardium and great vessels arising from the base of the heart, the pericardium being incised longitudinally, otherwise the parts are studied in situ. The student learns the boundaries of these cavities and to demonstrate the position and relation of the viscera and peritoneum and pleura. After passing a successful demonstration the student dissects out the blood and nerve supply to the viscera, paying particular attention to the sympathetic nervous system and lymphatics. After the quiz the student takes up the dorsal aspect of the trunk.

Our method is to divide the body into five parts—head, right and left uppers, right and left lowers. Each upper includes the corresponding part of the thoracic cavity, each lower the corresponding part of the abdominal cavity.

The head is divided into 10 regions for quiz purposes, three of which require a superficial and deep quiz, so that the student has to take 13 quizzes on the head before his work is completed.

A lower is divided into 13 regions, 10 of which are again subdivided into superficial and deep, making 23 quizzes necessary.

An upper is divided into 11 regions, 8 of which are again subdivided, making 19 quizzes for each upper.

So that when the student has completed the dissection of the entire body, he shall have taken 97 quizzes altogether. It is to be borne in mind that these quizzes are not brief and superficial, but on the contrary are a complete review of the anatomy of the part under consideration. Two students may be quizzed at one time, but no more. This method requires an immense amount of work on the part of the teacher, but the student is drilled in talking and his powers of observation and description are exercised. Personally, I inspect the dissections from time to time, and when they are completed and quizzes taken, I make a final examination of them, and if the work is satisfactory I give credit on a day book; if the work is not reasonably well done or structures are overlooked, the student is directed to satisfactorily complete it.

When the entire body has been dissected and all quizzes taken the student presents his cards to me, and I check off the dates of assignments on the register and countersign the cards. The date of countersigning is also entered on the register. The register is a complete record of the work done by each student.

In the second semester of the second year the sophomores devote the time allotted to them for dissections to study of the brain. This continues for two months. The brains have been hardened in a 10% formalin solution, and each student is assigned one. Two students work together and having two brains for study, one can be sectioned longitudinally and the other transversely. In this way they get the opportunity to study two kinds of sections.

The students are first required to study the encephalon as a whole, the basal and external surfaces, then the meninges and blood supply, followed by relations to the cranial wall. One brain is sectioned longitudinally in the median plane and the mesial surfaces of the hemispheres receive attention, then the cerebral lobes and their boundaries, sulci and convolutions; by transverse horizontal sectioning the centrum ovale minor and major are studied, lateral ventricles and their boundaries are next taken up and so on.

At this time another brain is sectioned transversely on a plane through the corpora albicantia, the optic thalami, caudate and lenticular nuclei are studied in regular order. In fact, every part of the cerebrum is revealed and studied in the order of logical sequence.

The thalamencephalon, mesencephalon mentencephalon, myelencephalon and myelon are studied in a similar manner. The basal ganglia and nuclei are located and nerve tracts traced. After the encephalon has been studied the regular recitation hours are occupied in the study of the cranial nerves, and their superficial and deep origins work-

ed out in conjunction with the laboratory work. Many of the specimens are beautifully adapted to show the difference between the white and gray matter, many nerve tracts being readily traced.

A certain amount of work is assigned for each laboratory period and when that is mastered, each student recites and demonstrates to the teacher the parts under discussion as they appear in the specimens before him.

After the brain dissection is completed a review quiz is taken and the card is signed up.

The remaining two months of the semester are occupied in the study of the spinal nerves and sympathetic system, eye, ear and nasal cavities.

During the whole course the embryology of the first year is constantly referred to.

There can be no doubt but that the teachers in the anatomical department are kept busy, and that the students have ample opportunity to become proficient in their anatomy.

Different text books have been used and the general consensus of opinion is in favor of Gray, in combination with a dissecting manual, such as Barkers.

TOBACCO AMBLYOPIA (FROM CIGARS) IN A WOMAN.*

By WALTER SCOTT FRANKLIN, M. D., San Francisco.

K. K., a native of Sweden, single, 52 years old, a woman of refinement and education, consulted me February 19, 1908, for failing sight..

Her family history showed nothing of importance. She has had the usual diseases of childhood, otherwise no serious ailment until the present. Uses tea and coffee moderately, does a large amount of brain work and was not questioned in regard to the use of tobacco.

Patient could not state definitely how long her sight has been failing. She remarked that it was difficult to distinguish gold from silver coins and on two occasions had given a five-dollar piece in place of a nickel. At no time has she had any pain either within the head or eyes. One week ago she realized how poor her sight had become and until that time had attributed her failing vision to advancing age, expecting to have same corrected with a pair of glasses.

The following is the examination: Head well shaped, face comparatively symmetrical. Eyes deep set in orbits. Palpebral apertures equal, lids normal. Movement of eyes good, lids closely followed the rotations of the globe. Conjunctivae and corneae negative. Pupils moderately large, equal, reacted sluggishly to light, normal to convergence and consensually.

The lenses and media were clear, the changes on the discs being the only ophthalmoscopic findings. The discs were distinctly paler and somewhat shallow on their temporal quadrants. The retinae were absolutely negative, the blood vessels normal.

Corneal astigmatism was one diopter with the rule in either eye, the retinoscopic findings being hyperopia one D vertically and 1.75 D horizontally. Tension of globes normal; not sensitive to deep pressure.

Vision was reduced to counting fingers at six feet with the right eye and at five with left. The correction did not improve the vision.

The reduced vision and the circumscribed paleness of the optic discs on their temporal sides led me at

once to suspect a toxic amblyopia in an advanced stage. When questioned in regard to the use of alcohol or drugs her denial was positive. This led to the question of tobacco and much to my surprise she admitted smoking cigars. For the past two years patient has been smoking from six to eight domestic cigars daily. She has never used a pipe or cigarettes and though impressed with the seriousness of her condition denied the use of alcohol. It is true that people ordinarily deny drinking, being somewhat ashamed of the confession, but in this case the admission regarding smoking and the character of the woman make it morally certain that her answers were correct.

Her field of vision showed a relative central scotoma for form and an absolute central scotoma for red and green. The scotoma made an oval from Mariottes blind-spot to the macula.

I was able to demonstrate hemeralopia and with a number one London smoked glass her vision was sensibly improved.

Owing to the reduced vision, the absolute scotomata and the pallor of the discs, the prognosis for central vision was not favorable.

The total abstaining from tobacco was impressed upon the patient, strychnine was injected hypodermatically and potassium iodide in large doses given internally.

The sight has gradually but steadily improved, the scotoma for white or form being absent, that for red and green still remaining in a relative sense, but difficult of demonstration.

On September 5, 1908, patient's condition was as follows: Exterior of eyes negative. Pupils slightly larger than the average and reacting comparatively quickly to light, etc.; papillae still show a paleness on temporal third, the nutrient vessels standing out as thin lines and a distinct shallowing being noticeable. Vision being 20/30th with either eye alone, and 20/20th minus with the correcting lenses, i. e., practically normal vision. Field as denoted above.

Beer first called attention to tobacco as an eiological factor of amblyopia in the beginning of the nineteenth century. His observations were unnoticed until Mackenzie in 1854 again remarked this point, and it was not until the sixties and seventies that the writings of Hutchinson, Forster, Nettleship and others gave it prominence.

The pathological changes in the optic nerve due to tobacco are identical with those caused by alcohol and the mixed intoxication of alcohol and tobacco. A peculiar predilection is shown for the papillo-macula bundle of fibers lying in that portion of the nerve between the globe and the optic foramen. The inflammation is purely interstitial in character, is limited to the central bundle of fibers and brings on atrophy by the subsequent cicatricial contraction. These pathologic changes account accurately for the clinical signs, the loss of central vision, and show how guarded the prognosis must be when examining a case giving evidence of the atrophic state of these fibers, remembering that atrophied nerve fibers do not regain their vitality. The paleness of the disc, before the state of atrophy, is caused by a relative devitalizing effect on the fibers from the inflamed and swollen interstitial tissue. Complete atrophy is the end of the inflammatory state and results in permanent loss of central vision, though the peripheral sight may remain unchanged. A number of isolated cases of complete atrophy of the optic

nerve following the misuse of tobacco have been reported, but those having large clinical facilities deny its existence. Most likely it is a complication of atrophy from spinal origin. Others have described the lesion as beginning at the macula and the neuritic atrophy as secondary to this.

Various authors have questioned the occurrence of a purely alcohol or tobacco amblyopia, claiming that a mixture of these two is necessary for the above changes to come on. It has been shown that either alone may produce this typical change. Uhthoff, in 327 cases of intoxication amblyopia, found 41 due to tobacco alone, the remaining 286 being equally divided between alcohol and the mixed use of these two.

No clinical differentiation is possible between the intoxication of tobacco alone, alcohol alone or the mixed form. Although claimed that tobacco caused the neuritis to begin in one eye before the other this is not characteristic of the drug. A positive differential diagnosis can not be made either by the character of the scotoma or the course of the symptoms. According to Martin the pupil is contracted in the tobacco cases and dilated in those due to alcohol, but this is not certain and in my case the pupil was moderately dilated.

Very few experiments have been undertaken on animals with nicotine, and the results of those few unfortunately vary with different observers.

Men have no particular predisposition toward toxic amblyopia, the large majority of cases occurring in the male sex being due to a wider misuse of tobacco and alcohol among men than among women. Still, in women, the amblyopia is generally of the mixed form and my case comes under the heading of a pure nicotine neuritis.

As most cases come on between the ages of 35 and 55, Fuchs observes that one's tolerance toward tobacco diminishes with years. Cases occurring in very young adults are suspicious of hereditary neuritis optica.

Unfortunately no statistics are available showing the percentage of strong smokers who get tobacco amblyopia. Among polyclinic eye cases the percentage of pure nicotine amblyopia varies from 0.04 to 0.13 of one per cent. This percentage is presumably greater in certain countries and in private practice.

According to Lewin cigars cause the largest percentage of toxic amblyopia, then follow in descending order cigarettes, pipes and the Turkish hookar or water pipe.

The particular use made of the tobacco has no direct influence on the neuritis as chewing, inhaling, swallowing the smoke, cold smoking, etc., have all produced their cases.

Tobacco contains from 2 to 8 p. c. of nicotine, depending upon the nativity, grade and freshness of the plant. The Havana tobacco of good grade and light color contains the least nicotine while the cheap domestic brands are higher. Ordinarily green or wet tobacco has a higher percentage of nicotine than the dry forms.

The amount of tobacco smoked daily necessary to produce toxic amblyopia varies from 30.0 gm., the figure of Hirschberg, to 15.0 gm., as given by Groenouw. Taking this roughly as containing 4% of nicotine, we find that it is necessary to smoke approximately from 0.75 to 1.0 gm. of pure nicotine a day in order to produce a toxic amblyopia. But, of course, the total amount of the nicotine contained within the cigar does not enter the smoke, and it has been calculated that about 17% is carried this way. Every puff makes the cigar stronger, as the smoke is filtered through the entire portion of the remaining cigar, hence the one who throws away the last quarter or end piece avoids, according to Theodorovits, approximately 50% of the entire amount of nicotine. This applies to cigarettes also, and it is well known how the Spaniards throw away their cigarettes after taking but a few puffs. The above quantity of nicotine is contained in 7 to 8 of the cheaper domestic cigars and about 10 or 11 of Cuban, or approximately 60 cigarettes.

The brand of cigar smoked by the patient reported was a domestic article, the filler being from the cheapest grade of Cuban tobacco and the wrapper seed tobacco.

V. Jaksch reports a case of death in a young adult from 0.05 gm. of pure nicotine, showing what a powerful poison this is.

It has always been a source of wonder to me how an intelligent person could allow a reduced vision to go unnoticed. This applies particularly to the case above where the patient allowed the vision to fall to approximately 1/400 of the normal without applying for relief. The explanation lies in the insidiousness of the attack and the absence of pain. Most patients complain of a slight haze or fog in front of the eyes, and those wearing glasses attribute same to the glasses, mentioning that they would clean their glasses four or five times a day, not realizing that the trouble was in the eye. The day blindness, hemeralopia, is usually not real, as in my case, but due to the excessive light of the sun causing blending. The diminished light of night causes the pupil to dilate, brings a larger portion of the retina into the central field and thereby gives the impression of better vision.

The diagnosis is made by the reduced vision, the paleness of the temporal quadrant of the disc and the central scotomata. The latter are in the beginning but relative for colors, then for form and vary toward all degrees of the absolute depending upon the stage of the neuritis.

In a large number of cases the complete stopping of nicotine will effect a cure. This should be impressed upon the patient, and it is found that those suffering from nicotine will more readily stop smoking than the alcoholic subject give up his drinking. Hence, the outcome is more favorable from the tobacco cases than from those due purely to alcohol or the mixed use of these two drugs. Smoked glasses, potassium iodide, strychnine, electricity, etc., have all been used and with good result.

I have purposely avoided mentioning the other changes occurring in the eye and other portions of the system from tobacco and alcohol, limiting my paper to the chronic retro-bulbar neuritis. Other drugs capable of producing similar changes to the above are strammonium, cannabis indica, chloroform, chloral, opium, bi-sulphide of carbon, nitrobenzol, arsenic, lead, iodoform, and the toxin of diabetes.

A CASE OF PYLORIC STENOSIS IN THE NEWLY BORN.*

By HENRY J. KREUTZMANN, M. D. San Francisco.

On Sunday, the 10th of May, 1908, at 9:40 a. m., a baby boy was born to Mrs. A. E. in this city. Incidentally I might mention that about two years ago I had performed Alexander's operation upon the lady for retroversion and slight descensus of the uterus. Pregnancy (it was the first) was without mishap; the lady is of short stature, but her pelvic measurements being normal, delivery occurred without any difficulty in shorter time than usual, owing to a strong, muscular physique of parturient. The baby was perfectly normal; its weight at birth was 7¼ pounds, it acted in every way as a perfectly normal baby; it took the breasts and showed a phenomenal development, gaining 7 ounces the first week, 10 ounces the second week, and eleven ounces the third week after birth. On the eleventh day of its life I performed circumcision, the urethral opening in the prepuce being rather small.

When two weeks old the baby vomited for the first time. This vomiting, coming shortly after circumcision, was attributed to the disturbance brought about by the little operation. The next day the baby vomited again, once a day, then twice a day, then oftener. The vomiting occurred at first after the same meal, at 6 a. m.; this same 6 a. m. vomiting was kept up all along; to it was added another and another; finally the baby vomited also in the night time, which before he had not done; before he had kept all his night meals well. The vomiting took place soon after nursing; the quantity varied, also the manner, being sometimes the usual throwing up, at other times more forceful. There was considerable gas belched and passed per rectum. The passages were frequent but very good in consistency and color. The baby was sleeping, resting, gaining; for this reason no weight was attached to his vomiting for some time.

When the baby was just three weeks old, I saw for the first time the baby vomiting; it was soon after a meal; he had taken the breast very energetically and when he vomited, milk, partly coagulated, was expelled with a great deal of force, passing even through the nose. I was astonished and somewhat perturbed over this sort of a vomitus; but the baby appearing without any distress, I consoled myself with the old adage: "Babies who throw up —grow up," or I rather had in my mind the Ger-

man word, Speikinder—Gedeihkinder, which means the same.

Under the circumstances, the baby thriving, sleeping and gaining, I did not oppose when the family wished to go to their summer home in Menlo Park. The trip was made in an automobile the next day, Monday, the baby sleeping on the way. After the arrival in the country the baby vomited more and began to show some restlessness; so Dr. Harry B. Reynolds of Palo Alto, to whom I had referred the family, was called. When the patient did not sufficiently improve under his treatment with change in diet, physics, lavage of the stomach and rectal feeding, I was called and I saw the baby on Tuesday, June 10th, in the forenoon, six days after the first visit by Dr. Reynolds.

At our first consultation the question of pyloric stenosis was not taken up. The baby was fairly well nourished yet; the inspection of the child failed to show anything peculiar; we looked upon the case as one of disturbed digestion, hard to explain though in its etiology. When after thirty-six hours of absolute inanition and continued vomiting, the baby was seen again, we both agreed that the case was one of stenosis of the pylorus. I felt distinctly the tumor in the region of the pylorus; but even then the distention of the stomach was not great, probably because nourishment was withheld at the time before examination.

To be prepared for every emergency the baby was removed to the Adler Sanitarium in this city the next morning, June 12th, 1908. Dr. Langley Porter was called in consultation, and from that time on we treated the patient conjointly.

During our observation the case presented a typical picture of pyloric stenosis in a baby, as characteristic as ever one has been described. Temperature kept normal, pulse at times rather rapid and weak. Patient vomited everything that he had occasion to. No fecal matter was discharged per rectum, only the residue of rectal feedings, mixed with bile stained secretion of the intestines. The urine became very scanty, concentrated, the salts of uric staining the diapers blood red. The supraumbilical region was greatly distended, bulging; the distention was due to the stomach; at times the antiperistaltic waves of the stomach could beautifully be seen. The infra-umbilical region appeared insignificant. At times, not always, a button-like hardness could be felt in the region of the pylorus.

Our next effort was to keep the baby alive. He was kept warm, handled as little as possible; olive oil, later sweet lard, was rubbed into his skin, and alimentation carried on through his rectum. Besides this general idea of preserving his vital forces as much as possible, we resorted to three distinct attempts of therapeutic measures, calculated to overcome the pyloric stenosis.

1. Acting on the idea that the contents of the stomach, either gastric secretions or ingested food, was producing the obstacle through irritation, the stomach was washed, weak predigested whey, or Vichy water was given; no result.

2. The patient was at times very restless, appar-

ently in great pain, did not sleep; in order to relieve the suffering, to induce sleep and at the same time, possibly, to overcome the spasms that might cause the stenosis, opium, chloralhydrate, bromides were given; the result as far as pain and sleep were concerned, was obtained, but as far as the stenosis was concerned, the result was nil.

3. As a directly curative measure, regular teaspoon doses of olive oil were given per os upon the recommendation of some authority; no result.

The patient was losing weight and ground slowly but steadily. The critical time for the decision for surgical interference arrived. This could not so easily be determined. On one side we had to consider that an intra-abdominal operation in so small a baby constitutes a most serious undertaking; on the other side, the proper time for a possibly life-saving operation must not be lost; we did not wish to resort to the operation in extremis, with no chance for recovery. So after eight days of expectant treatment we decided for an operation. Doctor Cheney and Doctor Lewitt saw the patient and were kind enough to corroborate our diagnosis as well as our proposition for immediate operation.

Having knowledge that Dr. Stillman, shortly before, had successfully operated in a similar case, we suggested that he should do the operation in order to give the baby the very best chances.

On June 19th, 1908, posterior gastro-jejunostomy was performed by Dr. Stillman. The mass was seen and palpated but no time lost to find out much about it. The baby stood everything very well, was slightly collapsed, but responded to stimulation, soon took water and kept it down. For a few days he would occasionally vomit bile-stained mucus and we feared that the much dreaded circulus vitiosus might have been established—but everything went well; vomiting ceased, the bowels moved, the wound healed well—in one word he survived. It required a good deal of experimenting but finally a proper food was found and he soon began to show increase in weight, not rapid, not regular, but increase anyhow, and his weight is now 13 pounds. The abdomen shows the normal aspect of a healthy infant; digestion is perfect.

DR. WM. FITCH CHENEY.

I have seen four cases of pyloric stenosis in infants, all of them in consultation.

Case 1. Seen with Dr. R. W. Baum in February, March and April, 1905. This baby was born in January, 1905, nursed exclusively at the breast and remained perfectly well until three weeks' old. Then he began to vomit. The food was changed to a condensed milk mixture, then to peptonized milk, then nothing was given but a weak brandy solution; but vomiting persisted with all. His weight fell from 9 to 6⅞ pounds. I saw him first on February 28th, when he was seven weeks old. He was then greatly emaciated and had a very definite peristaltic wave across his stomach whenever the viscus was filled. Lavage always showed retention in the stomach. His weight had fallen to six pounds by early April. It then re-

mained stationary for a time and then gradually the baby gained and vomiting ceased. By May 7th he weighed again 7⅝ pounds and after that gained continuously and normally. Both Dr. Baum and myself felt that peptonized milk in small amounts and daily lavage were what kept him alive.

Case 2. Seen with Dr. B. W. Stark on March 4th, 1908. The baby was then three weeks old, nursed at the breast from birth. He began to vomit at two weeks, apparently all food taken, shortly after nursing. This vomiting persisted in spite of milk sugar solution, condensed milk and peptonized milk mixtures. The food would frequently be retained for several feedings and then be vomited in large quantities. Emaciation rapidly occurred. Physical examination showed a definite peristaltic wave over the stomach and a palpable mass in the right hypochondrium, the size of the thumb. Lavage always showed food residue in the stomach. A gastroenterostomy was performed by Dr. Stanley Stillman on March 10th and the infant recovered.

Case 3. This was seen on June 9th, 1908, with Drs. Kreutzmann, Lewitt and Porter and has been described in detail by Dr. Kreutzmann. This infant was normal at birth, nursed at the breast, did well for three weeks and then vomiting began, persisting in spite of various kinds of food, with rapid loss in weight. The abdomen showed a peristaltic wave and a mass at the hypertrophied pylorus. Gastroenterostomy by Dr. Stillman on June 19th resulted in recovery.

Case 4. Seen in consultation with Dr. W. B. Lewitt, October 8th, 1908. This baby had been nursed at the breast exclusively but began to vomit on the 17th day of life and had vomited persistently since then, at first infrequently, gradually more constantly. After two or three nursings a large quantity would be vomited. There had been loss of weight from 8 pounds at birth to one ounce less than 7 pounds. The abdomen showed a peristaltic wave and a palpable mass as the pylorus. This case is still under medical treatment. Dr. Lewitt will report it in detail.

DR. LANGLEY PORTER.

It has been written, "We are most ignorant of what we are most assured." The worth of this axiom is never more clearly brought out than in its relation to the subject under discussion to-night. When one has seen a few little sufferers from congenital pyloric stenosis, one wonders that the condition escaped notice, until within recent times. It is true that Beardsley, of New Haven, in 1781 described a case with post-mortem notes, which seems to belong in this classification. And there are several other reports, notably that of Williamson (1841). It was not, however, until Hirshsprung, in 1887, reported three cases with autopsies that attention was centered on the condition and that observation and study were directed to it. Even at that time interest was aroused in but a few clinicians, chiefly Englishmen and Germans. Before 1808, while recorded cases were few and pathological data scanty, a school of observers, ably led by

Pfaundler of Munich, denied this symptom complex a place as a clinical entity; but in the face of accumulating material carefully reported from America as well as Europe, this position became untenable and these observers admitted the occasional occurrence of such a condition. But they doubted the diagnosis of a large proportion of the published cases, which proportion they assumed to be due not to a cognenital malformation but to a physiological error which had given rise to pyloric spasm. The Edinburgh and London men at this time were for the most part impressed with the idea that the condition was a true stenosis due to an obstructing pyloric tumor which was visible and palpable in the post-mortem room. As the matter stands to-day no one denies that cases occur during early infancy in which there is definite hyperplasia of the circular pyloric muscle with more or less complete stenosis, which cases present no signs or symptoms other than those referable to obstructions of varying degrees at the pylorus. The most characteristic of these signs are propulsive, cumulative vomiting, visible peristalsis of a large thickened stomach, shrunken hypogastrium, wasting, scanty urine and scanty meconium-like stools. The usual time of onset of these signs is in the latter weeks of the first month, most often in the third, as distinguished from the onset of symptoms immediately after birth in that very much rarer and always fatal condition, pyloro-duodenal atresia. Why the onset of symptoms in hypertrophic stenosis is delayed no one has explained. Miller and Wilcox, however, have shown that vernin secretion is very much increased in coagulating power. We know that digestion is a developing function; we know that during the colostrum period vernin is not secreted by the human infant's stomach, and it may very well be that the appearance of this secretion is delayed in these cases, and that while there is no vernin, the milk, uncoagulated, can flow through a very narrow pylorus into the duodenum and there undergo digestion. But when late fermentation appears when coagulation takes place in the stomach, the physiological guardian action of the pyloric ring muscle becomes developed, and in its hypertrophied state it so overdoes its duty that the normally developed antagonistic longitudinal muscle cannot overcome its contraction, and obstruction is set up. I hope at a later meeting to report on the development of the vernin function of young babies.

There is a great diversity of opinion among the best minds of our profession in regard both to the etiology and to the treatment of the condition; the two extremes are represented by Hutchinson, Heubner and Bloch on the one hand, and Scudder and Morse on the other. The first hold with Pfaundler and attribute the obstruction to spasm of the stenosed pyloric ring muscle rather than to its hyperplasia alone. Hutchinson would go so far as to exclude all cases from operation, while Scudder and his colleagues consider that properly diagnosed cases of pyloric stenosis should at once be operated upon, and they attribute little value to spasm as a factor in the obstruction that occurs in such cases. The

third school, which seems to me to have right with it, is led by Cautley, who since 1898 has seen more than twenty cases and who has given the matter very deep and earnest consideration. He admits the condition called by the Munich men, pure pyloric spasm, exists and thinks that many cases diagnosed pyloric stenosis that have spontaneously recovered are examples of this state. He further divides the cases of pure pyloric hyperplasia into those in which the circular muscle is so hypertrophied, the pyloric passage so narrow and the mucous membrane so folded that the stenosis is absolute and anatomical. The second class of case from his point of view is that in which although the hypertrophy is well marked, the pyloric canal is narrowed but to a slight degree, and in which the folds of the mucous membrane do not cause complete, continuous obstruction. Obstruction in this class of case he thinks may be attributed to irritative spasm of the hypertrophied pyloric sphincter, and patients suffering with this type of case under wise feeding may recover without other treatment. The first class in which I think are included all the cases reported to-night can be relieved only by operation and these patients will certainly die unless they are so relieved.

John Lovett Morse has recently published a most illuminating report on a case of this class which was successfully operated. Gastroenterostomy was done in the second month. During the eighth month the child died of a peritonitis, probably pneumococcic. After operation the child had developed in an absolutely normal way. On examination of the pylorus a perfectly characteristic tumor was found, spindle-shaped, obliterating the canal and extending into the duodenum, in appearance like the cervix uteri. In fact, the post-mortem findings differed not at all from the post-mortem findings obtained from other children, in whom death had been directly due to the obstruction of such a tumor. This case proves that at least some of these tumors do not alter as the Pfaundler-Bloch school teaches, and become patent in the later months of life. And such post-mortem findings clearly show that all cases of this disease are not due in any degree to spasm. As a student I saw a number of Cautley's cases and those of Voelecker and Newton Pitt and I have had the good fortune through the courtesy of Doctors Kreutzmann and Krone to be allowed to aid in the diagnosis and conduct of two cases in this vicinity, and Dr. Lartigau allowed me to be present at the operation of his patient; so in all, I have seen in eighteen months, three undoubted cases of this symptom complex of vomiting, pyloric obstruction, visible peristalsis, and depressed hypogastrium with scanty stools. I have further seen within the last few years four cases of intractable vomiting that correspond in type with the so-called pyloric spasm of the Pfaundler school as emphasized by Kopik in his recent paper. Personally I can see no justification for bringing these two groups of cases into juxtaposition. The spasm cases show a vomiting of vastly different type and do not have so marked hypogastric recession. The visible peris-

talsis in them is one that is so slight that it would escape attention were it not diligently searched for and since I have been looking for visible peristalsis of minor degrees, I have seen it in a number of little babies who, so far as one can judge, were suffering from nothing except too large amounts of food, or food of too high a fat content. Moreover, these babies are almost always bottle babies in contra-distinction to the stenotic babies who are usually breast fed. There seems to be no difference between this so-called pure pyloric spasm and the condition that arises in older infants accompanied by hyperchlorhydria.

In considering this morbid entity many interesting questions arise. A certain number of cases in which the clinical picture has been correctly drawn by excellent observers and which must have been true types of this disease, have gone on to recovery without operation. The validity of these observations cannot be doubted and the first question that arises is, "Why should we operate at all?" The answer to that is contained in the experience of untreated cases 89% of which have died, contrasted with the operative cases, 43½% have died. To quote the operative figures is not to make a fair statement of the cases either, because for a number of years after Hirschsprung's paper, diagnoses were delayed and operative interference was also delayed even after diagnosis, while the patient was treated expectantly. Moreover, even when the patient came to operation, operative procedures were more or less experimental. Pylorectomy, for instance, has been advocated, attempted and abandoned. Loretta's operation has also been practically abandoned in this country, Germany and England, although it is still the operation of choice in Scotland. Gastroenterostomy is only now being generally adopted, not because it is ideal but because it is practical, and the results, as you can realize from the cases reported to-night, are increasingly favorable. I have no doubt that in the near future when medical men are alert for this condition and bring their little patients early and in fair condition that the surgeon will save at least 90% of them.

When to operate is the second question that presents itself. Robert Hutchison, of London, is the only authority with extensive experience who unqualifiedly opposes operation under any circumstances. He justifies himself by the report of fourteen cases with one fatality. To quote him, including one case that died, the mortality has been one in fourteen. All the others have got well, and when I say well I mean perfectly well. I have followed these cases for three or four years and they remained perfectly healthy children, and I would say that the majority of cases, so far as I have seen, are not left with dilatation of the stomach; the condition seems to be one of genuine cure. Hutchison rejects the use of drugs, opium and belladonna, and where he has tried it, he rejects rectal feeding because he has found it impossible to make children retain for any length of time solutions given by rectum. He stakes his whole therapeutic attack in systematic diurnal stomach washing and in frequent-

ly feeding the child, if possible, small amounts of human milk, and if this is not feasible he gives thoroughly peptonized milk with an equal quantity of water. He calls attention to the danger of opium even in minute doses and cites one instance where 1-20 of a minim of the tincture given before each feeding for six or seven doses rendered the child comatose. He says in his experience relief cannot be expected for a long time. Although the children cease vomiting they go on losing weight for two or three months, and suddenly when the clinical picture seems blackest, they round the corner and begin to improve. His idea is that the disease is nothing else than a spasm of the hypertrophied pylorus and when the child is weak enough the spasm spontaneously gives way. He goes so far as to predict in the future operation will have no place in the treatment of this condition. So far at Hutchison's cases are concerned, I heard him report them in person, and in the discussion Cautley stated that he doubted very much the accuracy of the diagnosis; but allowing him full weight for the cases reported, considering the brilliant results that surgeons have achieved in this field, can we be justified if we allow these children to lag along in suffering and distress for four or five months and go on to a condition that will make a chance of successful surgical intervention slight, should that intervention become necessary? Personally, I believe not. I believe that stomach washing and medical treatment should be limited at the most to ten days or two weeks. If in that time there is no amelioration a surgeon should be called; but if during that space there is some improvement or even if the child but holds its own, then, unquestionably we are not justified in advising operation.

But after all is said and done, of this condition we know nothing at all save that we are very sure that some nurslings in their first month present a symptom complex that can be due only to obstruction at the pylorus and that some infants with such symptoms will have an enormously overgrown, hard, contracted pyloric sphincter. Beyond this we lose ourselves amidst the fogs of conjecture. We are not even certain that we have not included two or more conditions under one heading. Of the etiology we know nothing whatever. We are equally at a loss to explain the manner of onset even as we are to understand why some of the cases die while others go on to spontaneous recovery. We are indeed in this matter "most ignorant of what we are most assured."

Discussion.

Dr. Cheney: I simply wish to make a résumé of some of the points. Our object always with these babies is to save life and the essentials to saving life are accurate diagnoses and consequent careful consideration as to the means at our disposal for cure. In regard to the diagnosis, I wish to point out that there are two distinct classes of cases. There is hypertrophic stenosis where there is distinct organic thickening of the tissue and also that group of cases known as pyloric spasm which are possible to cure without surgical means. Our duty is to decide with which condition we are dealing. This matter has been gone over very carefully to-night. It is possible to form an opinion as to whether the case is

one of spasm or stenosis by the condition of the abdomen, by the difference in the peristaltic wave, the absence or faint rumbling of gas in the cases of spasm, or a palpable tumor in the stenosis which is in many cases present. It is not possible at a given time to decide this question and therefore the wisdom in delaying until we have watched the case in an effort to decide. By careful watching it is possible to decide whether we have stenosis or spasm and then we are guided somewhat as to whether we shall recommend surgery or not. If the case is decided to be stenosis we must even further carefully consider it, for as Dr. Porter brought out, some of the stenosis cases get well without operation. Yet the percentage is so small in consideration with the percentage of cases that die that it is not justifiable to wait and take that chance if the diagnosis of stenosis has been made. The other factor to be considered in these cases is the surgeon, the qualifications of the man who is going to do the work and what he is going to do. I do not believe that these cases should be operated upon indiscriminately, my fear is that the reports to-night will cause a good many babies' abdomens to be opened by incompetent men. It is not at all an operation to be rushed into. In the second place, what is the surgeon going to do when he does operate? It has only lately been pretty well decided that the gastroenterostomy offers the best chances. I might advise operation for gastroenterostomy where I would not advise operation for divulsion. If the operation is done by the best possible technic and by the best man, we have evidence that the results are good. All of the cases reported to-night have had good results, the only case of stenosis reported where the child died was the case allowed to go unoperated upon.

Dr. Barbat: There is not a great deal left to say upon this subject. The first case which attracted my attention was the child of a woman whom I delivered in 1904. The child did very well for two weeks, and then began to vomit, at first occasionally, then after every feeding. Change of diet made no difference, and a diagnosis of pyloric stenosis was made and operation advised. The parents changed doctors and the baby died at the age of six weeks. An autopsy revealed a stenosed pylorus, which would only admit a probe. The next case is the one which has been reported by Dr. Mohun. I confirmed the doctor's diagnosis, and agreed with him in regard to immediate operation, before the child became too weak. We operated on the 21st day after birth, and found on opening the abdomen at the site of the pylorus, a hard, glistening white mass the size of a marble. A no-loop posterior gastroenterostomy was done without reversing the jejunum, but keeping it in its normal direction. The baby was allowed some nourishment the same day, and at the end of five days was getting practically regular nursing. Although the operation is attended by many technical difficulties, the children take their anesthetic like milk and are ready for nursing in the afternoon. It is comparatively easy to do a gastroenterostomy on a dog or rabbit, or an adult, but when we attempt to operate upon a three weeks' old baby with a contracted intestine, it is a different matter. In this case the jejunum was no larger than an ordinary lead pencil, and it is not a particularly easy thing to place two rows of stitches between the stomach and jejunum. I have my doubts regarding the large number of cases reported as recovering under medical treatment alone, and believe that they are all to be classed under the spasmodic type and not the true stenotic type. During my trip east I inquired about this class of cases and received a good deal of information from the internes in some of the hospitals. I found that there have been a number of patients operated upon but not reported on account of the fatal results. There are a number of reasons for failure in these cases, faulty

technic, and delay in bringing the patient to the surgeon being the principal ones. The medical man must bring the surgeon in consultation early, before the child has become too weak to stand operative measures. If this is done we will look for a very large percentage of recoveries in these otherwise hopeless cases. It is a mistaken idea that it is more dangerous to give a new born baby an anesthetic and operate upon it than to wait until it is older. I have done major operations on babies less than twenty-four hours old without any trouble, where it would probably have been fatal if I had waited.

Dr. Dudley Tait: My personal experience with the operative side of this question is limited to one case the clinical history of which was given to you to-night by Dr. Brown. In this case, after having failed to control the vomiting by means of a gastrojejunostomy, I made a gastroenterostomy on the fifth day but even then failed to get the desired result, the patient dying three days later without any local reaction. No autopsy having been performed nothing of interest can be elicited by further reference to this case. It has seemed to me to-night after listening to the numerous papers that this question has been viewed entirely from the weakest side of surgery, the mechanical side. After having perused the case histories in American and French literature no impartial observer will be convinced as to the cause of the congenital pyloric stenosis and therefore the propriety of surgical intervention in this condition. The question still remains unanswered, are we dealing with pure spasm or advanced pathological condition? Personally, I am inclined to favor the spasm theory, with gastritis as a possible factor, for the following reasons: first, the not infrequent onset of the clinical syndrome upon changing the infant's food; second, its variable date of occurrence often as late as three or four months after birth; third, the clinical and postmortem evidences of gastritis, mucus, pus and bacteria in the vomitus; fourth, the pathological findings in cases recovering under medical treatment and dying later from other causes, in one case as late as six months afterwards. In several such cases reported independently by Batten, Ibraham and Bloch, the autopsies showed hypertrophy and stenosis fully as marked as in the cases that had died after operation; fifth, the hypertrophy does not involve the stenotic ring alone but the entire region of the pylorus and generally the prepyloric area, the longitudinal and circular fibres being increased; sixth, in animal experimentation I have found that any injury involving the perpyloric area (elastic ligaments, etc.), will give a spasm of the pylorus, this spasm having been noted at autopsy as late as the ninth day. No sections, however, were made in this case and consequently I am not prepared to state whether or not any muscular hypertrophy existed; seventh, similar muscular hypertrophy has been found in other parts of the body; eighth, in the numerous reported cases of congenital pyloric stenosis in infants I can only find two in which tests were made to determine the presence of pyloric permeability; ninth, a very large proportion of cases recover under purely medical treatment. All these facts render it impossible to state definitely what part surgery is to play in the treatment of congenital pyloric stenosis in infants. When we remember that the Mayos are retracing their steps in gastric surgery, restricting the list of operable conditions, when we note that foreign surgeons who have had considerable experience with the operative treatment of infantile pyloric stenosis are becoming more conservative, we must admit that the surgeon must possess something more than mere mechanical views if he decides to invade what seems to be the medical man's domain.

Dr. MacMonagle: I have never had any cases of

congenital pyloric stenosis in infants. In a general way I am inclined to take the stand which Dr. Tait has taken. The question of the future health of the child operated upon and the action of the pyloric stenosis and the artificial opening after operation, seem to me very important and worthy of consideration. The reports of the future health of these cases will certainly be very interesting and instructive. In a number of cases of gastroenterostomy done upon adults, an autopsy some time after, has shown the pyloric stenosis cured and the artificial openings closed. In other cases, it has shown both the pyloric stenosis and the artificial opening closed. This condition of affairs is certainly very grave and should receive serious attention in coming to the decision of operating. Of course if there is an absolute obstruction of an organic nature, to the passage of material from the stomach to the intestines, there is only one thing to do in order to give the patient the slightest chance of relief, that is relieving the obstruction by making the junction of viscera in the way that seems best, or by removing the obstruction by leaving the pyloric stenosis as it is and opening a new channel from the stomach to the intestines. I do not mean this as a criticism upon the cases that have here been referred to to-night, as I believe these cases were carefully diagnosed and well treated. I merely want to raise the question of the future action, of the difficulties in such cases and in regard to the surgical procedure in all cases, as I fear that some enthusiasts may be led to surgical means as a relief before it is clearly established that a good result cannot be obtained by medical means.

THE FAUCIAL TONSILS CONSIDERED FROM A MEDICAL AND SURGICAL STANDPOINT.

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The mere mention of the subject of this paper will bring to our minds thoughts, and probably experiences, we have had concerning these masses of lymphoid tissue.

Treat the subject as lightly as you will, nevertheless the prominent position of the faucial tonsils at the orifice of the respiratory and alimentary tracts, their exposed position to foreign substances, their close relation to the cervical lymphatics and their great vascularity gives them an importance not easily ignored. One remarkable feature is that these organs so ready of access and so easily observed have remained a kind of medical enigma.

What passes in the mind of the average observer when examining the tonsils? He notes if they are red, swollen and for the presence of exudate. If this trio are absent his investigation, as a rule, ceases and so the tonsils have remained for many years comparatively unmolested except for the tonsillotome (which is capable of removing a piece of the tonsil) and a long list of gargles and swabs.

Gradually the importance of a more serious consideration of the faucial tonsils has forced itself upon us. Aside from their local effect, their relation to certain systemic conditions has proven so intimate that in many instances our previous lethargy has changed to alarm.

Considering the faucial tonsils as a pathological entity they may be regarded from two points of view. First, diseases characteristic of themselves with their local effect and second as a portal of infection whereby the general economy may suffer from some apparently remote disorder.

By a gradual pathological chain the acute forms of tonsillitis can be merged into the chronic and so, various types of tonsillitis can, for clinical purposes, be described as a continuation of the same inflammatory disease. An acute superficial or catarrhal inflammation may readily subside or it may extend to the more severe form of lacuna tonsillitis, more commonly known as follicular, where the infection extends into the tonsillar crypts which accumulate a debris of epithelial cells, leukocytes and bacteria. These crypts form a favorable spot for the encouragement of bacterial growth and the tonsil reacts against it by inflammatory reaction. Let this condition carry us to the next type, i. e., parenchymatous inflammation where the stroma of the tonsil becomes involved; this may assume an acute condition where pus is formed from an infection of the surroundig tissue, as in peritonsillar abscess or quinsy. A more chronic course may be followed which resolves itself into organized inflammatory exudate in the form of scar tissue and an hypertrophy of the connective tissue. The acute lacuna tonsillitis just mentioned may assume, like unto itself, a chronic form the so-called caseous tonsilliti; which consists of masses of inspissated secretion and bacteria mixed with food.

What the agent is that prompts these various changes and decides whether an acute superficial inflammation will subside as such or go on to graver forms can only be determined by knowing the nature of the infection which originally involved it in disease or attacked it later.

During the acute and chronic forms of tonsillitis many investigators have demonstrated the presence of pathogenic micro-organisms such as streptococcus, staphylococcus (aureous and albus) and diplococcus. In lesser frequency are found the pneumococcus, Kloebs-Laeffler bacillus, staphylococcus citreous, micrococcus tetragynous, micrococcus albus liquefaciens, bacillus tuberculosis, leptothrix and other forms.

Whether an acute attack can leave a permanent stigma upon the tonsil or whether it requires a long series of acute infections to accomplish the same end is merely a matter of degree; suffice it to say that the ill effect of the presence in the throat of an obstruction that can so impair functions and development, is a matter of serious consequence.

The effect of enlarged faucial tonsils upon articulation and deglutition is most marked. They can change the development of the mouth and nares such as faulty dental alignment, narrow palate arch and drooping lower maxilla. Note the dull and listless manner with stupid expression and thick lips. The local effect upon the mucous membrane of the entire respiratory tract from constantly breathing through the mouth causes a hacky cough and tendency to chronic bronchial affections. Their influence upon taste, hearing and smell is marked. Disturbed sleep with efforts at breathing has an influence upon the development of the chest and we see in these cases the so-called pigeon-breast.

Many reflex symptoms might also be mentioned, due to local irritation from the enlarged tonsils.

It is not my intention to enter minutely into the histology and pathology of the faucial tonsils, yet a few words regarding lymphatic tissue will show how we may class them and what relation they hold to the general economy. A true lymphatic gland consists of a capsule of connective tissue which sends fibrous prolongations inward dividing the gland into various divisions. The center of the gland is composed of a loose and rectiform tissue through which flows lymph. The functions of these glands seem to be to neutralize certain toxins and destroy bacteria; they act as cleansers or scavengers. If the glands become overtaxed by the continued presense of a toxin, an excessively virulent bacteria, or by a lessened vitality they become, instead of a protection, a veritable focus of disease distributing their poisons directly to the lymph circulation.

In describing a lymph gland I have in a word embodied the construction and function of the tonsil for like a lymphatic gland it consists of a stroma of connective tissue containing blood and lymph vessels and in its depth germinating centers where are found cells undergoing mitotic division, the lymphocytes. The faucial tonsil only differs from a lymphatic gland proper in its epithelial covering which dips into it in the form of crypts; its exposed position and relation to external influences.

As all lymph glands are part of and in the direct course of the lymphatic circulation, and as the tonsil is an integral part of this system, is it not interesting to follow some of the experiments that have been attempted to determine the powers these glands possess in their resistance to toxins and bacteria and if overcome by such their resulting influence upon the general system? The difference in relation of the tonsils and lymph glands to the lymph channels is that in the tonsil they have their origin while they merely pass through the lymph glands.

The usual course of an infection, if succeeding in passing the various barriers, would likely be through the tonsil into the deep cervical chain of glands beneath the sterno-cleido-mastoid muscle thence to the thoracic glands and finally the thoracic duct. It thus distributes an infection directly into the circulation, producing such conditions as general sepsis, rheumatic arthritis, endocarditis, nephritis, leukemia, general tuberculosis, pleurisy, etc.

Four cases are here appended demonstrating the close relation between a tonsilitis and various organic lesions. They were taken from the records of Dr. R. Langley Porter and Dr. Philip King Brown.

Case No. 1: A child, female, aged 9. Endocarditis, double mitral lesions. The child comes complaining of shortness of breath, some dizziness and an occasional fainting spell. She is very pale but moderately nourished, well grown and apparently anemic. On examination she has chronically enlarged tonsils with a chronic pharyngitis. Anterior and posterior cervical glands moderately enlarged. Chest shows slight rickety deformity. The heart is enlarged especially to the right. There are very marked presystolic and systolic bruits. The child is unquestionably suffering from a mitral stenosis with regurgitation, but the heart is well compensated.

In this case there is no history of any rheumatism or other infective disease, and the morbid condition can with assurance be assigned to the repeated attacks of tonsillitis of which there is a definite history.

Case No. 2: A female child, aged 11 months. Pseudo-leukemia infantum. The child has an adenoid and enlarged tonsils which show crypts filled with secretion, picture of acute tonsillitis. Up to the time of the onset the child was a perfectly healthy baby, had been properly fed and the attack of tonsillitis lasted about six days. After this the child began to go rapidly down hill and was very pale. An examination shows but 50% by the Dare instrument. The blood picture showed 12,000 leucocytes of which 80% were lymphocytes. There were many nucleated red cells, marked deformity of the red cells and a number of megalocytes. The spleen was enlarged and tender. The condition maintained itself for about two months and finally disappeared under careful feeding and iron therapy. There was no question that the toxemia which led up to the blood condition was directly due to the infection of tonsillitis.

Case No. 3: A. S., male, aged 14. Hematuria, rash, temperature. Seen in consultation with the history of having an attack of acute tonsillitis three days previously, and followed next day by enlargement of the anterior and posterior cervical glands. The posterior cervical glands were markedly enlarged and tender so that the head was retracted and carried in a position to suggest meningitis. On the fifth day of the disease a marked hematuria with a very definite diminution of urine was manifest. A question arose as to whether we were not dealing with a case of scarlet fever. It was decided that we were not because there had been no discernible rash, and there was no strawberry tongue or circumoral pallor; also the onset was not abrupt and the pulse rate never was unduly rapid. This decision seemed to be warranted when during the course of the disease no desquamation became apparent. This case may be looked upon as one of infection through the tonsils and naso pharynx.

Case No. 4: R. A., Dec. 12th, 1902. Age 6½ years. Endocarditis, tuberculosis, fever. History chronic constipation from birth. Bleeding with movements. Several attacks of protracted vomiting over a period of two years necessitating rectal feeding. Has had frequent bronchitis, also skin disturbance causing itching. Status: High color, coated tongue, Land systolic murmur all over heart. Liver tender over lower border, also in upper epigastrum. April, 1903: Loud systolic murmur, daily temperature per rectum 100-101°, pulse irregular. July, 1903: Removed portion of tonsil by tonsillotome, followed by fever each day over a long period of time. August, 1905: Tonsils very inflamed and complains of headache and fever each day, also palpitation of heart. Considerable prostration every afternoon. August 15th, 1907: Tonsils smaller and less troublesome. Mitral regurgitation plainly heard. Jan. 13th, 1908: Following several attacks of tonsillitis developed a swelling in right wrist. Dr. Levison by X-ray, etc., makes a diagnosis of tuberculosis of a tendon. Feb. 5th, 1908: Dr. Deane removed tonsils by radical method which were found to be small, adhesive and deeply imbedded. Feb. 5th, 1909: One year later. Wrist symptoms entirely abated, slight systolic murmur. Child has never been in such good physical condition. Has gained markedly in weight and strength.

As to the tonsil having a direct connection with the respiratory tract, an infection can start by taking the same course but from the thoracic glands it can pass through the hilus of the lung to the visceral pulmonary lymphatics and by that means infect the apices of the lung, which, on account of

being away from the direct respiratory current and with less motion they form a peculiarly favorable position to harbor a tubercular infection. Dr. J. Grober made a series of experiments upon the lower animals illustrating this point, three of which I may be permitted to quote.

First experiment, September 16. A young rabbit was anesthetized by ether and chloroformed, and 1 c.c. of sterilized emulsion of black Chinese paint injected into the left tonsil.

September 23rd, 1902, the autopsy showed black particles in the blood. Behind the left tonsil there was a mass composed of the coloring matter and leucocytes. The lymph glands on left side of the neck, as far as the upper border of the thyroid cartilage, were stained black. The microscope demonstrated the lymph vessels filled with free coloring matter, as well as leucocytes which enclosed small particles of pigment.

The glands and lymph vessels were fairly packed with the coloring matter. Beyond the zone of the lymph glands and vessels little coloring matter was found.

Second experiment: A small dog was narcotized by morphin injections. Six and one-half c.c. of the sterilized emulsion of black pigment was injected into the tonsil.

The autopsy, after complete exsanguination, showed the following conditions: Very little coloring matter in the leucocytes, none being free in the blood. The tonsil and the loose connective tissue containing the afferent lymphatic vessels of the tonsil were of a deep black color.

Along the muscles of the neck, as far as the hyoid bone and to the median line, there were streaks of pigment. The pigmented area also spread downward below the hyoid bone, where it extended 1 cm. beyond the median line. The coloring matter was traced to the bony opening of the thorax and to the parietal pleura, which, when stripped off and examined by transmitted light, showed the black pigmentation. The lymph vessels of the paratracheal connective tissue and of the esophagus, as far as 2 or 3 cm. above the bifurcation of the trachea, were also colored, whereas on the left or uninjected side no such phenomenon was found. All the lymph glands on the lateral wall of the pharynx, hyoid bone, larynx, along the deep vessels of the neck and supraclavicular fossa on the right side were black. The parietal pleura at the apex showed an exudate, but no adhesion to the visceral pleura.

The miscroscope showed that in all the above-mentioned positions there were no other changes present. In the glands the coloring matter occupied the paravascular spaces. In the lymph vessels between the supraclavicular glands and the parietal pleura of the apex there was a large number of leucocytes filled with coloring matter. Free coloring matter was also present in this region. In the apex of the lung there were no signs of an inflammatory reaction. The coloring matter here seemed to be freely deposited within the connective tissue. In the above-mentioned exudate at the apex there was coloring matter in the leucocytes.

Third experiment: April 4. A small dog was placed under morphin narcosis and 5 c.c. of coloring matter injected into the tonsil. April 13th, the same experiment was performed on the opposite side.

May 10th, the autopsy, after exsanguination, showed a large amount of coloring matter free in the blood; the leucocytes, the tonsil and connective tissue, and the connective tissue of the neck on both sides along the larynx to the aperture of the thorax were colored symmetrically. The lymphatic glands along the large bloodvessels, as well as those in the

supraclavicular region, were deeply stained. The coloring matter was also found within the lymphatic vessels and in the paravascular spaces. A fibrous exudate was found in the apices of both lungs, thus forming a bridge of inflammatory material from the parietal to the visceral pleura. The coloring matter was also present in the exudate. The microscopic appearance of the apices presented a light grayish coloration. The glands in the mediastinum were stained on the left side, as were also the bronchial glands. In the left lung there were three other small fibrinous exudates in which the coloring matter was present.

From these experiments Grober builds the hypothesis that "tuberculous infection of the apex of the lung may take place via the deep lymphatic chain, the supraclavicular glands, and thence to the parietal lymphatic vessels, where an inflammatory exudate is thrown across to the visceral pleura. The tubercle bacilli travel across this inflammatory bridge and enter the apex of the lung."

I may state that these experiments have only to do with foreign particles of inorganic matter. What inhibitory effect this lymphatic tract would have upon the passage of bacteria is problematical but likely far more marked.

From the experiments of Kayser, Goodale, Hendelsohn, Grober and others, the following conclusions have been drawn:

1. Minute particles of foreign matter such as dust, carmine and other pigments when locally applied are rapidly absorbed by the tonsils from their crypts and are found in sections of the tonsil removed as early as fifteen minutes after.

2. Bacteria do not pass so readily and are hard to discover in the tissue of the tonsil.

3. Ordinary organisms are probably absorbed less rapidly on account of the resistance of the mucous membrane, and if they enter the parenchyma they are promptly destroyed unless able to resist the phagocytic powers in the tonsil and even in the latter case their virulence is likely altered.

4. Virulent organisms can follow the same course as dust particles and may cause local lesions, lymphatic involvement and an infection of any part of the body.

5. Tubercle bacilli may lodge and remain indefinitely in the crypts of the tonsil ready to be absorbed at any time, though not necessarily involving the tonsil in actual disease.

A topic which concerns us mostly is the nature of enlarged cervical glands and the mode of their infection. We have been in the habit of calling such glands scrofulous or lymphatic, though through extensive investigation Schlenker and Kreuskmann, as described in Virchow's Archives, have shown that a large per cent of these glands are due to a tubercular process, the infection either proceeding in a retrograde manner from a tubercular focus in the lung or more likely from the tonsil. Following up these cases the tonsil was examined in certain instances; tubercle bacilli were found in the follicles where they had penetrated the epithelium, in others tubercles and giant cells were found in the sub-epithelial layer.

Case No. 5: Case of a child seen in the clinic for tonsillectomy. Tonsillar tuberculosis. The

tonsils were very much enlarged and the child had an adenoid. These were removed and the child was sent in for examination as to its general condition. The lungs and heart were perfectly normal, and the child was normal in every way. No sign of tuberculosis or any other organic disease, although the tonsils macerated with sand and, injected into guinea pigs showed, by characteristic tubercular infections, that these tonsils harbored tubercular foci.

Acute tonsillar tuberculosis hardly concerns us here, as it is found as a part of military tuberculosis or as a metastatic process in the last stage of pulmonary tuberculosis, it produces great destruction in the form of ulcers with yellow miliary nodules. In strong contrast to the acute form is the chronic which usually exists without marked symptoms. This infection might come about in two ways, either secondarily by contamination with the sputum, where the bacilli lodging upon the tonsil are forced into the crypts or primarily by inspired air, the tonsil being rendered more susceptible by having lost its epithelium through inflammation.

Orth, in Virchow's Archives, and Baumgarten have shown that the tubercle bacilli in food is a frequent cause. In their experiments they fed animals with tubercular tissue and demonstrated later tuberculosis of the cervical and bronchial glands.

A chronic tuberculous tonsil may remain as a local condition or as already described it may infect the cervical glands and pass directly to the main lymph channels, causing a general miliary tuberculosis or more likely to the pleura and a bronchial gland which could break down and empty its contents into a bronchus. The latter I believe to be more common than we imagine judging from the frequency of such an occurrence in the cervical chain.

I have devoted rather more space to the tonsil in its relation to tuberculosis than I had intended, but allow me a word more to explain my position. I am not attempting to show that the tonsil is the main channel of tuberculous infection, but it is one important means of contagion that is proven beyond a doubt.

As the tonsil is a portal which may convey tuberculous infection to the lymphatic circulation so it can transport by the same channel other infections. Rheumatic symptoms in the joints and muscles so frequently follow attacks of tonsillitis that it is useless to review or quote from the extensive literature upon the subject. Any of us, in our limited private practice, can state instances of the relations of the two and so strongly has it been impressed upon us that the salicylates, as a remedy for tonsillitis, have with many become almost a routine practice, whether it is apparently indicated or not.

Fletch Ingals states that 45% of acute tonsillitis has a rheumatic history. There is not as yet evidence to prove that the tonsil is the chief portal for entrance of the rheumatic poison; considering, however, that in all probobility acute articular rheumatism represents a mild type of septic hematogenic infection of the joints there is no reason why the tonsils with their notorious faculty for infection with pyogenic germs should not possibly, even

frequently, assume the role of an infected wound leading to septic consequences of a systemic nature. The septic conditions vary in degree and location and rheumatism is one of the phenomena.

After considering the tonsils from a pathologic standpoint we are naturally led up to the therapeutic. Whether the condition is acute or chronic, whether the tonsil is acting as a mechanical obstruction in the throat or a portal whereby the system is the subject of general infection, must be considered.

The natural aversion of the laity to surgical interference leads us first to the application of local remedies or to drugs that may neutralize the toxins already in the blood. Little has been accomplished by this means. The exposed portions of the tonsilse continually bathed in secretion and in active motion are poor surfaces to retain for more than a moment any application. The general cleansing of this area by peroxid of hydrogen or an alkalin wash seems about all that can be accomplished by a gargle. The local application by a swab to the surface of the tonsil of tincture of iron, iodin, guiacol, the silver salts, etc., may possibly have some merit, though not marked. The deep crypts, though quite inaccessible, can be washed out by a small syringe with any antiseptic, such as pyoktanin, carbolic acid, formalin, peroxid, etc. The use of the actual cautery or various cauterizing reagents, with the idea of destroying part of the tonsil, are to be discouraged, for, where it is deemed that such treatment is necessary, the more radical procedure of removal is far more effective.

The question as to what are the indications for removal of a tonsil is a subject that can easily lead to discussion and many differences of opinion.

Since the advent of the so-called radical operation, where the tonsil is dissected from its attachments and removed entirely within its capsule, we have within our means a much more effective and wider range of action.

The much used tonsillotome can hardly be of service except to remove a large projecting mass, most of the tonsillar tissue being left behind. It certainly has its advantages in removing an obstruction, but there its usefulness ends. Many tonsils have been removed thus, with a satisfactory outcome, but they have all belonged to a simple hyperplastic type where the tonsil acted only as an impediment. Against a long list of tonsil troubles the tonsillotome and local applications have remained helpless.

Allow me to recite a clinical picture that we have likely all seen. A child ranging from ten to fifteen years of age, sallow complexion, poorly nourished and equally poor appetite, listless, subject to sore throats and colds and a hacky cough. We feel distinctly a chain of lymphatic glands in the neck running from the tonsil downward. In the throat are two small lobulated and boggy tonsils barely projecting beyond the pillars and adhesive to them in places. They look red and congested, as also the surrounding tissue. As to the possible systemic condition associated with this case we might mention a long list of which I have

already spoken earlier in this paper. We are satisfied that these tonsils have lost their vital resistance, and aside from their local effect are acting as a portal for some kind of infection. It is in such a case as this, with many similar varieties, that the complete extirpation of the tonsil is indicated.

The operation may be performed either during the administration of a general anesthesia, as in small children, or by local anesthesia, which is practicable in many larger children and adults.

By the first method the patient is placed in a prone position and ether vapor administered by a rubber tube passed through the nose into the pharynx. The assistant stands on one side and manipulates the mouth gag, tongue depressor and sponges. The surgeon stands on the other side, and, after drawing the tonsil outward with a tenaculum, dissects it from its attachments; i. e., plica supra tonsillaris above, the plica triangularis below and the anterior and posterior pillars, finishing by cutting or snaring it from its attachment to the superior constrictor muscle of the pharynx, through which pass its bloodvessels and lymphatic connections. By avoiding the vessels of the anterior and posterior pillars no serious bleeding need be anticipated.

Immediately after removing the tonsil from its base there is a sharp hemorrhage which is readily checked by pressure.

The removal of the tonsil by local anesthesia is altogether a more pleasing procedure. A solution of cocain carbolic acid is applied locally and cocain with adrenalin is injected into the deeper structures. The patient is in a sitting position and can frequently assist by holding his tongue down. The operation is quite bloodless on account of the deep injections of cocain and adrenalin and absolutely painless.

The post-operative treatment of these cases is a subject which I believe must be given careful attention. We have opened up numerous lymphatic channels in their exit from the tonsil, and until granulations have formed over them they can act as a ready means of absorption, producing many of the various forms of sepsis that were originally feared might emanate from the tonsil. Some time ago Dr. Leo Meininger was called to treat two cases which I had, several days previous, operated upon by the radical method. They impressed me deeply and I felt that rather than blame the operation of complete extirpation that the poison had entered through some faulty technic of surgical asepsis. Dr. Meininger has kindly supplied me with the following histories of the two cases:

Case No. 1: R. C., age 12 years old. Entered my service July 31st, 1908, complaining of pain and swelling of both wrist joints, ankle, on right side. She also complained of pain over the precordial region, all of which she had since July 29th, 1908. Denies having had measles, scarlet-fever, diphtheria and rheumatism. Has had chickenpox and also states that she has had quite a number of colds, sore throats, etc. She further stated that on July 25th she was operated upon by Dr. Deane for radical removal of the tonsil and that two days after operation commenced to have pain and swelling in wrist joints and then in ankle joints. Mother called in physician who found her "very sick" with considerable temperature and great pain. On examination found the above-mentioned joints painful and somewhat swollen and on examination of cardiac region found a systolic murmur at the apex transmitted to the left and an accentuated second pulmonic sound, the beats being irregular and rapid. Child had temperature of 104.2° per rectum and pulse 148. At the end of four weeks joint symptoms had entirely disappeared and defect in heart sounds hardly perceptible.

Case No. 2: E. A., age 9 years. Was called to see child Oct. 27th, 1908, with the following history: Was operated upon by Dr. Deane for removal of tonsils, complete operation on Oct. 22nd. 1908. On the evening of Oct. 26th mother noticed a rash on body and the child was suffering from a general malaise, loss of appetite and some temperature. On examination found on the inner side of both thighs and on the face an erythematous rash which itched considerably. Temperature by mouth of 101.6° and pulse 100. The child had been on a selected diet since operation of milk, eggs and gruels and had only been out of bed 24 hours before I saw her. The child was sick for about one week when the symptoms disappeared.

From a long series of cases that it has been my privilege to operate upon these two have been the only ones that have been followed by systemic infection. They constitute less than two per cent of the total number of operations in my experience; none the less they act as a warning and have tended to make me more thoughtful in the post operative treatment.

Previous to the operation the mouth, teeth and pharynx, also the nose and nasopharynx are cleansed by means of an alkalin antiseptic solution, use of the tooth brush and the throat swabbed with peroxid of hydrogen.

Following the removal of the tonsil after all bleeding has been checked, the fossa tonsillaris is painted with a five to ten per cent solution of nitrate of silver. This not only acts as a caustic and antiseptic but also as a styptic. After the patient has sufficiently recovered from the anesthetic the mouth should be again and repeatedly cleansed with the alkalin solution, alternating with peroxid.

Perfect quiet in bed should be insisted upon, for aside from lessening the chances of a secondary hemorrhage it prevents the patient from exposing himself to infection and renders less likely the absorption of any septic material by the lymphatics. Only food that has been sterilized by cooking should be permitted, drinking water boiled. The usual practice of swallowing cracked ice or ice-cream, purchased in the neighborhood, should be prohibited.

A detailed consideration of the cases I have operated upon by the radical method in the last three years I will reserve for a future paper. My present opinion is that the operation is based upon sound surgical principles and the only remedy for many a diseased tonsil with general systemic involvement.

THE TESTS FOR INVOLVEMENT OF THE LABYRINTH IN SUPPURATIVE MIDDLE EAR PROCESSES.

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Within the last two years Barany of Vienna, after much painstaking research work, has devised a series of tests by which the involvement of the labyrinth in suppurative middle ear and mastoid conditions may be ascertained. These tests are based upon the normal reflex reactions of the semicircular canals in producing nystagmus of the eyes: the findings may show the reactions normal, in which event involvement is ruled out; or that they are impaired, lost, heightened or abnormally produced, in which event the condition of the organ, considered with the other functional reactions of hearing and the objective symptoms shown, may be quite accurately ascertained.

Purkinje, in 1825, first discovered nystagmus, but as he observed it in cases of insanity, thought it only occurred in and was one of the symptoms of that condition. Flourens, about the same time, experimenting on pigeons, discovered that when one of their semicircular canals was destroyed, the bird reacted with somersaults in the plane of the destroyed canal, and this gave the first clew to the part played in orientation by this organ; Goltz, in 1870, elaborated and propounded the orientation theory. It was not, however, until 1892, when Ewald made some exact experiments, that a definite law of the production of the nystagmus of the semicircular canals was discovered. Ewald took pigeons and blocked the canals with wax at a point about opposite the ampulla. Then into the bony wall close to this blocking point, between it and the ampulla, he introduced a movable piston, the end of which played upon the endolymphaticum. By squeezing an air bulb attached to this piston he pressed it against the endolymphaticum and produced a movement of the endolymph in the direction of the ampulla and hair cells; by a suction movement of the piston backward a reverse movement of the endolymph took place. Ewald discovered that the nystagmus produced by these experiments was always in the direction contrary to the movement of the endolymph. The direction of the nystagmus is indicated by the direction of the short, quick movement (it being the first movement); the slow movement of recovery being, of course, in the opposite direction. Thus the law is: *The nystagmus is always in the direction opposite to the movement of the endolymph.*

Barany devised a series of tests whereby the movement of the endolymph is produced by turning the patient in a revolving chair. If the patient, sitting upright with his head erect, is revolved, let us say to the right, the horizontal semicircular canals lying in the plane which is acted upon by the centrifugal force, has a resulting movement of the endolymph. The endolymph of the anterior vertical and posterior vertical canals (lying at right angles to the plane of this force) is unaffected by it. The endolymph of the horizontal canals, when the patient is being turned, following the law of a body at rest, remains at rest unless acted upon by some external force, is contrary to the direction of turning and the nystagmus is in the direction of turning.

However, as it is impossible to measure the nystagmus while the patient is being revolved, it is disregarded. When the patient is brought to a stop after being turned ten times, the endolymph, following the law of a body in motion remaining in motion, is circulating in the direction of the revolving—to the right. The nystagmus is now to the left, and the patient being stationary the duration of the reflex movement is timed with a stop watch from the instant of stopping the revolutions to the time of cessation of the reflex movement. When the horizontal canal is tested the nystagmus resulting is a horizontal nystagmus; that is, the movements are horizontal. By bringing the patient's chin down, and flexing the head forward at right angles, the anterior vertical canals are brought into the plane of the centrifugal force, and the endolymphatic movements now take place in them; the horizontal and posterior vertical canals being unaffected. The nystagmus from the anterior vertical canal is rotary, corresponding to the wheel-like motion of the eye, and, in direction, follows the law of being contrary to the direction of endolymphatic movement. By bending the patient's head sharply over either shoulder and revolving him in a similar manner, the posterior vertical canals receive the centrifugal impact and the resulting reflex is a vertical, up and down nystagmus. By successively changing the position of the head in this way all the canals may be tested, and the results show that *each canal produces the movement in its own plane:* the horizontal canals, lying in a horizontal plane, produce a horizontal nystagmus; the anterior verticals, lying in a plane at once vertical and at right angles to the antero-posterior axis of the eye, produce a rotary or wheel-like nystagmus; the posterior vertical canals, lying in the sagittal plane, produce a vertical up and down nystagmus. This gives us our clew to the physiology of the movements. Standing erect, and revolving to the right on the long axis of our body, our eyes move quickly in a horizontal direction to the right and fix an object; the revolving movement of the entire body carries them soon beyond the fixing point. This corresponds to the slow reverse movement. The eyes then jump to the right again to fix, and thus the nystagmus-like movement keeps up. This movement is produced reflexly, when the revolution is rapid, by the movement of the endolymph in the horizontal, semicircular canals. A similar movement of the eyes takes place in an action like a somersault in a vertical direction, and is produced by endolymphatic movement in the posterior vertical canals which lie in the sagittal plane. The anterior vertical canals on being brought into play in an action corresponding to a boy turning a "cart-wheel," the resulting nystagmus is rotary, the reflex corresponding to wheel movements of the eyes when looking up, and to the right or left; and down and to the right or left (Donders listing), which is the position the eyes would assume in an attempt to fix in a movement of this kind.

Through these movements of the endolymph, too, we perceive our relative position in space, particularly in the dark, when the eyes furnish no added information. For example, in waking up at night in a sleeping-car berth, we know at once when the brakes are applied, or when the train is increasing its speed through this organ. In birds, with their sensitive orientation through the three dimensions of space, we find the canals relatively enormously larger and better developed. In man their function is retrogressive, and the part they play in orientation is comparatively insignificant.

If the eyes attempt to fix a revolving object a nystagmus results, which is designated as optical nystagmus. It is best seen, perhaps, in persons looking out of the window of a rapidly moving train. It is seen resulting from retinal irritation in albinos and in miners. It can be seen in the experiment of taking a cylinder which revolves on its long axis, and printing stripes on the curved surface running parallel with its long axis. The patient is told to look at the cylinder, and unconsciously fixes his regard on the stripes. When it is revolved slowly the optical nystagmus is seen. If the patient stands with the line of regard at right angles to the stripes the nystagmus is vertical; if it is parallel the nystagmus is horizontal. This nystagmus is stronger than that originating in the semicircular canals; and in testing the latter, the optical nystagmus is eliminated by placing opaque spectacles on the patient, and while he is being turned he is instructed to keep his gaze directly into the center of the opaque glasses, or "blind specks," as they are conveniently called. The normal duration of the nystagmus, after being turned ten times in one direction, with the same velocity, and with blind specks on the patient, varies from twenty-five seconds to two minutes; the average is about forty-five seconds for the horizontal and twenty-two seconds for the vertical and rotary. Without blind specks the nystagmus lasts only fifteen to twenty seconds. Rapid turning increases the duration. Patients of high nervous organizations have a longer reaction, and in neuresthenics we find a maximum duration. The practical point in the examination is the comparison of the duration of both sides. It has been found by repeated experiments that two-thirds of a nystagmus, let us say, to the right is produced by the right labyrinth, the remaining third coming from impulses from the left. Contrary-wise two-thirds of the nystagmus to the left comes from the left labyrinth. If now we have a patient, who when turned to produce a right nystagmus, reacts with a shortened duration of it, let us say fifteen seconds, and when turned to produce a left nystagmus reacts with double the duration, or thirty seconds, we surmise a destruction of the right labyrinth; for both series of revolutions show the absence of impulses from the right side. This may be expressed graphically in the diagram:

Impulses from right labyrinth ‖‖‖‖	Normal reaction
Impulses from left labyrinth ‖‖‖‖‖‖	R. nystagmus.
Combined impulses ‖‖‖‖‖‖‖‖‖‖	
Impulses from left side ‖ – – –	Destruction
Impulses from right side ‖‖‖‖‖‖‖	R. labyrinth
Combined impulses ‖ – – – ‖‖‖‖‖‖	R. nystagmus.
Impulses from right side – – – –	Destruction
Impulses from left side ‖‖‖‖	R. labyrinth
Combined impulses – – – – ‖‖‖‖	L. nystagmus.

The tract of the nerve impulses is from the canals through the vestibular nerve to Deiters nucleus. From here axones are sent to the nuclei of the eye muscles, from there they pass to the eye muscles direct. Those axones for the quick movement pass to the nuclei on the same side; those for the slow movement cross over to the nuclei of the opposite side. The motor ocular nuclei receive impulses via the corpora quadnigemina from the cortical eye centers on the opposite side. This is perhaps better explained by the diagram:
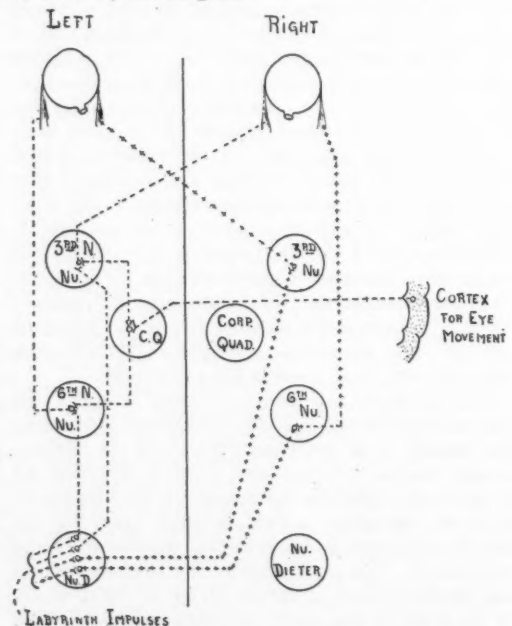
Scheme of tracts for horizontal nystagmus to the left side produced by the left ear.
— — — tracts of quick movement.
+ + + + tracts of slow movement.

In testing a person who, by occupation, is constantly revolving in one direction, the normal reactions will not hold. Ballet dancers who whirl only in one direction, which is the rule, show great difference in the resulting nystagmus when turned to the right and left. When turned in the direction in which they are used to revolving the nystagmus is very small, as a consequence of their continual practice, and lessening of the reflex.

The cortical impulses from the opposite side, reinforce the quick movements and the result is that the nystagmus is always stronger when the patient is told to look in the direction of the quick movement—the direction of the nystagmus. It is in this position that the duration of the nystagmus is best tested.

If the patient has a spontaneous nystagmus in looking strongly to the right or left, a point in the arc of rotation is selected in which it is not present, and with the eye in this position the tests are made. Barany has devised an instrument to facilitate this, which consists merely of a head band with a movable ball-tipped rod, which can be swung and fixed to any point in the visual field. If the patient has a spontaneous nystagmus in looking strongly to the left, the rod is swung in the left field. The patient is told to regard the small ball at the tip as it is moved to the left. When a point is reached that produces the nystagmus, the arm is moved slightly back again to a point which does not elicit it, and the patient is observed carefully to see that no spontaneous nystagmus is present. He is then turned with the instrument in this position on his head, and as soon as the revolving ceases he is told to fix his regard upon the ball when the duration of nystagmus is noted.

As we have diverted to explain the physiology of the nystagmus, we will now return to the technic of the test. A revolving chair is used, which is best fitted with a stout iron rod running vertically up from the back of the revolving seat, six inches above the height of the average person's head, when he is sitting upright upon the chair. The surgeon is provided with a stop watch. If the light is not good he had better have his head mirror adjusted to throw an artificial light into the eye. The patient, for testing the horizontal canals, is told to sit erect with his head erect in the line of the axis of turning. The blind specs are adjusted, and he is told to look directly into them while being turned. He may hold the seat of the chair to steady himself. The iron rod is now grasped and the patient turned ten times, without accelerating or diminishing the speed. As soon as the turning is stopped the surgeon starts the stop watch. If he is being turned to the right, which produces on cessation of the movement, a nystagmus to left, the patient is told to look strongly to the left that the full duration and strengh of the nystagmus may be brought out. When the nystagmus ceases the surgeon stops the stop watch, and the duration is noted. The patient is then turned under the same conditions in the opposite direction; as the nystagmus will be opposite, he is told to look in the opposite direction when the revolving is

finished, and the duration of this nystagmus is noted and compared with that of the previous test. It requires a little practice to say accurately when the nystagmus stops. This is because it gets slower, with longer intervals betwen the jerks as it fades away. With practice, however, the surgeon soon chooses the same relative time of cessation. By bending the head sharply ninety degrees forward the anterior vertical canals may be tested; or bending it ninety degrees over the shoulder the posterior vertical canals react. The reaction of one canal, usually the horizontal, is all that is practically required; as the finding in one holds for all three. The turning tests are used in conjunction with, or supplement another simpler method—the *caloric* nystagmus.

If you take any vessel containing a fluid, and chill one side of it, the fluid on the chilled side following the well-known physical law sinks and a current is established. Contrary-wise, if you heat one side a current in the opposite direction is established. This holds in the semicircular canals, the narrowness of which causes them to respond quicker than is the case in a relatively wider vessel. The anterior vertical canal lying just behind the promotory, and in the vertical plane allowing the rise and fall of the endolymph, responds to heat and cold even applied no closer than the membrana tympani. The results is, if cold is used upon the left side the endolymph sinks, a current to the left is established, and the nystagmus, contrary to the current, is to the right and rotary in character, as produced by this canal. The contrary holds if heat is applied. On the right side, cold produces a nystagmus to the left; heat to the right. A convenient formula to remember the reaction is: the nystagmus runs away from the cold to the opposite side.

The test is made by simply playing a small stream of cold water, or warm water, gently and slowly upon the drum, or into the middle ear for five minutes, with an irrigating syringe and a canula. If the labyrinth is normal the patient responds with a rotary nystagmus. If it is destroyed, no reaction is produced. The water must be colder than the temperature of the body. The ordinary tap water is usually the proper temperature to be used. If the patient has fever this must be remembered and a higher temperature of water used if hot water is employed. The warmest temperature of water that can be used in the ear is 48° C. It takes a little time for the nystagmus to be produced in this way— it usually commences about the termination of the syringing. The reaction takes place very promptly in patients who have had the radical mastoid operation performed, as the water is brought into immediate contact with the wall of the canal. If the drum is intact and is very thick, a longer period of chilling is necessary to get the reaction. In some cases, when a mass of cholesteatoma or polyps fill the middle ear, the caloric change may not reach the canal, and no reaction would result, in which event we would have to rely upon the turning tests alone. The rotary form of nystagmus is accompanied by much more nausea than the other forms. This

explains the fact which has fallen within the experience of all aurists that some patients become dizzy and nauseated when their ears are syringed out repeatedly—as for the removal of cerumen—and which always accompanied the hot air treatment for oto-sclerosis.

Quite a few cases have been observed in suppurative processes of the middle ear, when the bony wall of a canal has been disintegrated, but the endolymphaticum remains intact, and the labyrinth responds to the turning and caloric tests. This condition is diagnosed by the compression and rarefaction of air in the middle ear. A Politzer bag is used with a tip that fits accurately and tightly into the external auditory canal. When the bag is forcibly compressed the air is forced through the opening of the bony wall of the semicircular canal and against the lymphaticum, producing a current of the endolymph and the corresponding nystagmus. Rarefaction of the air produces nystagmus in the opposite direction. This is known as the *fistula test*. The direction and character of the nystagmus will of course depend upon the site of the opening. the canal involved.

It has been known for many years that the galvanic current with the poles on each ear, and a current as small as two to four milliampers, produced a nystagmus. This has been investigated, and it is found that with a current from fifteen to twenty-five milliampers and one pole held in the hand, the kathode on the right ear gives rotary nystagmus to the right; the anode on the right ear gives rotary nystagmus to the left. The effect of the current is on the nerve proper. It reacts to the galvanic tests when the labyrinth is destroyed. The normal tonus of each ear balances the other. The kathode heightens the excitability—katelectrotonus; the anode lessens it—anelectrotonus. Putting the kathode to the right ear heightens the excitability on that side, and gives us the corresponding rotary nystagmus to right; the anode lessens the normal tonus, swings the balance to the other ear and gives rotary nystagmus to the left. Inasmuch as the effect is upon the nerve proper, this test is not used in the practical surgical examination, but may be useful in locating a lesion.

Another phenomenon may be mentioned, although it is not employed practically on account of the intricate optical apparatus necessary for measuring it, is the tilting of the vertical meridian of the eyes in lateral movements of the head. If we look straight ahead, and tilt our heads to either side, the vertical meridian of the cornea remains upright during the movement. Barany found in patients with destroyed labyrinths 4 to 16 degrees tilting of the vertical meridian, when the head was rolled over 60 degrees; in deaf mutes the tilting was 1-8 degrees in the same tests.

Intracranial lesions affecting the nystagmus tract give rise to a spontaneous nystagmus. It is often seen in disseminated sclerosis, hereditary ataxia, meningitis and meningeal hemorrhage, cerebellar abscess and tumors, occasionally in sinus thrombosis, and a number of affections of the brain. Excepting in cerebellar abscess and in sinus thrombosis, there is not apt to be any coincident ear discharge to confuse the surgeon as to whether the nystagmus is central or labyrinthian in origin. The majority of cerebellar abscesses come from a suppurating labyrinth. The infection passing through the channel of the internal meatus and in these cases the labyrinth is, of course, involved. In a case of suspected cerebellar abscess, with a chronic suppuration of one ear, a nystagmus to the same side, the tests showing no irritability of the labyrinth on that side, we are safe in assuming that the nystagmus comes from cerebellar irritation, because the labyrinth producing it is destroyed. Intracranial nystagmus is continuous; that originating in the ear is intermittent. Sudden destruction of one labyrinth gives a continuous nystagmus to the opposite side, from the sudden removal of the balanced tonus. The nystagmus in this case diminishes, and after a time disappears. After a labyrinth operation the balance is regained in about four days; in pathological cases the disease keeps up the irritation and a much longer period is required, but the tendency of these cases of spontaneous nystagmus is to diminish, as distinguished from the intracranial variety. Cerebellar growths have no accompanying ear discharge as a rule, and the ataxic and other nerve symptoms enable the origin of the nystagmus to be placed. Nystagmus only results from sinus thrombosis late in the case, when abscesses of the brain or cerebellum have been produced, or a meningitis has set in. At this period it is of no practical value to ascertain the origin of the nystagmus, as the treatment would be unaffected by the findings. In the great run of cases, consequently, intracranial nystagmus will not lead to confusion in drawing conclusions.

The routine of making tests in a suspected case, when dizziness is complained of in a patient with ear symptoms—dizziness should always make us suspect labyrinth involvement—is first to use the cold water test. If a rotary nystagmus to the opposite side results we know that the labyrinth is functioning. In some cases when the membranous labyrinth is not involved the organ may functionate, but still have an opening in its bony wall. So we proceed to the fistula test. If compression of air gives a resulting nystagmus, an opening is present, or we have heightened irritability from lues. If there is a resulting nystagmus from the caloric test, and none from the fistula test, we conclude that the organ is intact and not involved in the suppurative process. If we have abnormal irritability from syphilis, the compression of air only gives a faint, small amount of nystagmus—with a fistula present there is a strong reaction to the test. If the cold water gives no responsive nystagmus, we conclude that the labyrinth is destroyed, or that some mass like cholesteatoma or polypi interfere with the test. We now try the turning tests. If the nystagmus resulting is shortened, and only half as long in duration in producing nystagmus to the affected side as that produced to the opposite side we must con-

clude that the labyrinth is destroyed; if the turning tests show a normal reaction, an intervening mass must have been present in the caloric test to prevent the action of the cold water on the canal. The destruction of the labyrinth would of course be confirmed by the functional tests of hearing. Caution must be exercised, however, to be sure that the good ear is safely cut out, for the ordinary method of sticking the finger in the meatus of the good ear does not prevent the bone conduction of sound from the normal side to it. Barany found that many ears which had been operated on, and the labyrinth absolutely destroyed, afterwards had apparently a little hearing on that side until he devised a special instrument, which successfully eliminated the good ear in testing the other, and he then corroborated what he expected to find: absolute deafness. He also found absolute deafness in destroyed labyrinths before operation, in which the tuning fork, speaking and speaking-tube tests would indicate a slight amount of function to be present.

The nystagmus is accompanied by a few symptoms, such as the apparent falling of objects, the patient's sensation of falling, his effort to maintain his equilibrium; nausea and sometimes vomiting. In highly sensitive patients we may have a sensation of color or darkness; pallor, sweating, trembling, and, rarely, loss of consciousness. These quickly pass off. The optical sensation of falling objects takes place during the slow movement of the nystagmus. If we take, for example, a rotary nystagmus to the right, the sensation occurring in the slow movement to the left, objects will rotate and fall to the right side. The sensation in regard to objects is stronger when the patient looks in the direction of the nystagmus, which increases the nystagmus. In some patients the optical sensation takes place in both the slow and rapid movement, and in these cases objects will oscillate instead of appearing to fall. The patient has the sensation himself of falling in the direction of the nystagmus; he throws himself in the contrary direction to balance himself, and thus actually falls in the opposite direction. The reaction of falling is in the same plane as the nystagmus and opposite to it; that is, in a horizontal nystagmus the patient falls or throws himself to the right or left, according to whether the nystagmus is left or right; in a vertical he goes forward or backward; and in the rotary he tends to sidewise rotation in the fall.

The number of cases of suppurative processes in the ear, in which the labyrinth is involved, is larger than we would at first suppose. The subject is too new for accurate statistics to be gathered and the percentage stated at present. In the Allgemeinen Krankenhaus in Vienna, the tests I have described are in the routine of the functional tests performed, and in that institution two or three labyrinth cases are continually in the wards. Some months ago they had a record of ninety cases. This in itself is sufficient to emphasize the fact that when searched for they are found more frequently than the aurist would suppose; and they explain the fact that every once in a while the aurist found a case in which after doing a radical mastoid operation, healing was long delayed; the labyrinth was involved and not drained.

In every case in which the labyrinth is involved in a suppurative middle ear process, it should be opened and drained at the time of the radical operation. If a fistula is found, the same operation is indicated, excepting in a case where the patient has very bad hearing in the other ear. In this event chances might be taken, in order to preserve his hearing, and, after searching for the opening in the canal wall, its edges may be curretted, and reliance placed upon it being sufficient for drainage. It is distinctly dangerous to do a mastoid operation when the labyrinth has recently become involved, without opening and draining the labyrinth. In these cases the inflammatory capsule is not sufficiently developed to prevent the exascerbation of the labyrinthitis by the trauma of the operation extending through the internal meatus and setting up a meningitis. Undoubtedly many cases of meningitis following mastoid operations were due to this process. Even in older cases of labyrinth involvement this danger is present, and consequently to obviate danger and to prevent a long drawn out process of healing, it should be radically treated at the time of the mastoid operation.

THE LEUKEMIAS AND ALLIED DISEASES.*

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It is my purpose to consider a group of diseases not very often encountered, but one of peculiar interest, both from the pathological and the clinical standpoint. The etiology of this group is still a matter of doubt, though more and more observers are granting the point that we are dealing with clinical malignancy and possibly pathological malignancy. To call a certain group of diseases malignant does not, of course, help in the ultimate solution of its etiology since the causes of cancer are still unknown; but to grant that they are malignant helps us at least in a classification, prognosis and treatment.

A list of the conditions referred to recalls at once malignant disease with gradual transitions to the ordinary sarcoma. This list comprises the following diseases: Lymphosarcoma, leukosarcoma, chronic lymphocytic leukemia, chloroma, Hodgkins' disease. and other forms of pseudo leukemia, chronic myelocytic leukemia, myeloma. I shall attempt to offer proof that they are essentially malignant. Some show in their course an increase of various white cells in the blood, and it is this impression of increased leukocytes that is dominant in the minds of most physicians. I shall attempt to show that the importance of the blood picture is over-accentuated. I shall also try to show that the ordinarily accepted blood picture is not absolutely

*Read before the Cooper College Science Club.

pathognomonic, but is rather that of a biological re-action.

I have deemed it wise to recall certain features of these diseases especially the rare ones by means of clinical histories. I shall first recall the disease "chloroma,"—a case of which was reported to me by Dr. Feheleisen. The patient, a boy of eleven years of age, was seen on May 2, 1907. At the upper outer quadrant of the right eye a nodule was felt resembling an ordinary dermoid cyst. On the following day this was incised and was found to be solid—of a decided grass color, adherent to the periosteum. The pathologist's diagnosis was chloroma. On May 7, 1907, the eye, periosteum of the orbit, and the portion of the bone where the tumor originated were removed. On August 10th, three months later, small nodules were seen in the operation scar. In September practically all the glands of the left side of the neck were found swollen. Patient died November 15th, six and one-half months after the operation.

A most interesting case of chloroma, and a comprehensive consideration is to be had by Port and Schultz.[5] A boy, sixteen years old, died with the disease one month after first being seen. Blood showed twenty per cent hemoglobin, 740,000 red cells and 44,000 white cells. Most of the leukocytes were of the problematic and many named variety ordinarily called the large mononuclears. The lymph glands of the trachea and bronchi were grass green, and also tuberculous. The marrow of the long bones and the affected glands showed many large mononuclear cells believed to be myeloid and they regarded the case as a chloromatous, acute myeloid leukemia. They are of the opinion that the term has been used to include various sarcomata and hyperplasia. The only common feature being the grass green pigmentation.

That marrow cells may show definite malignancy is seen in the disease myeloma. The symptoms being fragile bones, neuraligic pains, intermittent fever, albumosuria uria, the latter is not necessarily pathognomonic being seen also in sarcoma of bone. A typical case of myeloma will be mentioned—one is described by Pirmin.[10] A man of fifty-six years had sciatic pains for seven years and pains about the chest for one year and a half. When examined he showed slight sensitiveness along the lumbar regions. Death followed after diagnosis of spondylitis. On the second and third lumbar vertebræ and pushing against the cauda equina was a soft colored tumor the size of a hen's egg, proceeding from the bodies of the vertebræ and definitely invasive in character, growing up into the intra vertebral pads. On the inner side of the sixth and seventh ribs a pigeon egg size tumor destroying the bone. On the manubrium a similar tumor the size of a fist. The other portions of sternal marrow showed similar change of less degree. Blood vessels showed no leukemic blood. Microscopically these tumors were made of large non-granulated cells with round central nuclei identical to the myeloblasts, and so regarded. Metastases in the other organs were nowhere demonstrable. Here then is a systematic

disease of the bone marrow showing itself in widely scattered parts never, however, beginning outside the osseous system. In this disease marrow cells show a capacity for malignancy, and the disease is quite comparable to lympho-sarcomatosis.

The nature of the leukemias has long been a vexed question, and the pith of the matter is this. Shall we consider the enormous production of new cells in the blood and the blood forming organs as a simple hyperplasia as for instance we see hyperplasia in infective granulomata, or shall we consider it as evidence of malignancy? The difficulty of the problem is increased histologically owing to the fact that we are dealing with the hemopoetic systems, the cells of which normally do not show a high grade of differentiation. Embryologically th myeloid and lymphatic tissues are developed separately, though the two tissues are found associated in organs such as lymph glands and spleen. In the leukemias one or the other of these two systems, not both, shows excessive growth. Physiologically this kind of dualism persists in the blood itself. Even in the leukocytosis of different diseases there is a sort of balancing by these cells of marrow and lymph gland origin. As the cells of marrow origin increase in the blood there is an actual decrease in lymphocytes, and as the polynuclears, and large mononuclears diminish there is an actual increase in lymphocytes until the normal cell equilibrium is again attained.[15] The disease is not limited to man, but has been seen to occur spontaneously in dogs, horses, pigs, cattle, cats, mice, and even in the hen.[4]

In this disease, leukemia, in the marrow, spleen, lymph glands, or wherever lymphatic tissue occurs, according to the form of the disease and the organ involved, one sees a great accumulation of different ripe and unripe cells, large mononuclear cells, myelocytes, eosinophiles, basophiles, polynuclear neutrophiles, and lymphocytes. This accumulation of cells has been variously construed. The older view still held by most observers is that this tissue represents a hyperplasia of the germinal cells of the blood-forming apparatus. In other words, those cells from which the myelocytes, polynuclears, and eosinophilic leukocytes are derived, the more or less primitive non-specialized cell tissues, show a hyperplasia. The cause of this hyperplasia is not known. Pappenheim[1] has lately described in one instance, structures within the leukocytes suggesting protozoa. Lowit described in 1898 what he thought was a sporozoa showing ameba-like motion, and believed he reproduced in rabbits a similar disease by inoculation.[18] Spirochetes as a cause of lymphatic leukemia and Hodgkins' disease has been claimed by White and Proscher.[19] The relation to trauma has been insisted on by Ebstein.[20]

Certainly a disease involving so many different organs and finally fatal is not the usual picture of hyperplasia. Even Pappenheim, who adheres to the older view of leukemia as a hyperplasia, acknowledges the existence of sarco-leukemia in which, with leukemic blood, aggressive and invasive growths occur actually malignant. In the early part of the present decade several observers ex-

pressed the view that the process was essentially malignant, and this view is gaining ground. Even in the present year Dietrich [11] has described in Hodgkins' disease a granuloma-like sarcoma of the lymph glands with definite growth in the surrounding connective tissue and veins. Chiari has likewise noticed the change of lymph gland hyperplasia, so called, to sarcoma. From a large mass of material it must be granted that a widespread sarcomatous change practically limited to the lymphatic system can occur, the more ordinary examples of which are the two conditions known as leuko-sarcoma and lympho-sarcoma.

The tendency is to regard the leukemias and pseudo-leukemias in much the same way; that is, as a sarcomatosis. In this connection I will mention the two interesting theories, of Banti and Rippert. Banti's [2] idea is that the leukemia and Hodgkins' disease are essentially malignant and sarcomatous, myeloid leukemia being a myeloid sarcomatosis of those parts, particularly the lymph glands and spleen. The changed blood picture is due in the case of the leukemias to the invasion of the blood channels of the blood-forming and lymphatic organs by the new cells, essentially tumor cells. Hodgkins' disease, according to this view, would be essentially the same as lymphatic leukemia, except that this invasion of new cells into the peripheral circulation has not occurred. That the blood picture of Hodgkins' disease may change to that of leukemia is well known. And we also know that in the case of an ordinary leukemia a recession may occur, during which period the blood approaches normal. The relation of Hodgkins' disease to the leukemia is easier understood by using this theory, for by thrombosis of the invaded blood vessel we can imagine the blood picture to change. The erosion of blood vessels by new-formed cells also explains the appearance of a leukemic blood in cases of lympho-sarcoma according to Pappenheim. [24] And such erosions or invasions have been often seen by many pathologists.

According to the second theory, that of Rippert, the etiology of the leukemia has to do with malignancy and the parasitism of human cells. A parasite need not of necessity come from outside the body. Cells of the body itself contributing nothing to the physiological needs of the organism, growing independently at the cost of surounding parts and capable of being transplanted and growing at their new site, are in reality parasitic. The less differentiated the cell the greater its possibility of growth. Carcinoma is thus a parasitic growth of displaced epithelial cells. Now the granular leukocyte and especially its progenitors, the less differentiated myelocytes, show many resemblances to single cells, parasites—protozoa, for instance. And under certain unknown conditions, these marrow cells taking on parasitic features, escaping the normal restraint of connective tissue and bone structure, grow lawlessly, enter the blood vessels, are carried into different organs and there multiply. Myelocytic leukemia is thus nothing more than a parasitic growth of marrow cells. Leukocytic leukemia, a parasitic growth in the germ cells of the lymphatic organs.

The question of malignancy or hyperplasia has largely to do with the three points. First, are atypical cells seen in the disease; second, are metasteses found; third, are invasive and aggressive growths observed. The first question can not be satisfactorily answered. In myelocytic leukemia, large cells of abnormal size sparsely and of unusual granulation are regarded as atypical. They are usually called non-granular myelocytes, myeloblasts, or plasma cells. In lymphatic leukemia, both acute and chronic large mononuclear cells in the blood has been so confusing that it was believed that mixed forms, myelocytic and lymphatic leukemias, occurred simultaneously. These large cells are now regarded as myeloblasts, or lymphoblasts. This atypical feature has been particularly noted by Sternberg [9] in his conception of the large cell lymphocytic leukemia, as leuko-sarcoma; others find this large cell present in all forms of leukemia, and under observation the small cell form may change to a large cell form, or the reverse may occur. The question still remains whether these myeloblasts, lympho-blasts or plasma cells are sufficiently foreign or atypical to be called tumor cells.

As to metasteses, we commonly observe in this group an involvement only of the hemopoetic tissues; naturally this growth of new cells, limited to only one tissue, does not agree with the commonly accepted views of metastatic growths. The question is made more difficult of solution by the widespread normal occurrence of lymphatic tissues in all the organs, so that we can not always be sure that certain leukemic tumors which develop in such organs as the liver, kidney, and skin, are not due to the growth of lymphatic tissue already present. In myelocytic leukemia, Banti cites the growth of myeloblasts in the parenchyma of the lungs which could not have developed from tissues normally present. While Rippert regards the enormous increase in the pulp of the spleen as transplanted myeloblasts multiplying as parasitic cells in the spleen pulp. That the large mononuclear cells, myeloblasts or lymphoblasts, do not show metastatic growths in the different tissues, may be theoretically explained as follows: Firstly, we are dealing wtih a sensitive, non-resistant fragile cell. Its susceptibility to chemicals and X-Ray as compared to the other more mature blood cells has been often proven. Secondly, that growths are observed only in previous existing hemopoetic tissue may be due to certain qualities alone possessed by these tissues and necessary to the large mononuclear cells' growth. In other words, in this tissue we may have a tissue of predilection. We see commonly how important this matter of predilection is in malignancy by the growing of metasteses from certain malignant tumors. Bone metasteses in cases of prostatic and thyroid cancer are notoriously common. Uterine carcinoma, for instance, shows bone metasteses in about $3\frac{1}{2}$ per cent. Thyroid cancer, on the other hand, shows bone metasteses in about 20 to 25 per cent. [25] The tendency of melanotic tumors to develop in the liver is another instance of this predilection. Leukemic

tumors commonly observed in the liver, kidneys, and skin, are regarded by some as true metasteses.

As to the third feature, invasive and aggressive character of the cell growth in the leukemias, this can no longer be doubted. From the involved gland in lymphocytic leukemia and Hodgkins' disease, the growths often push through the capsule, invading neighboring fat, connective tissue, bone, muscle and blood vessels.

What a definite feature this is in Hodgkins' disease is shown in the study by H. W. Gibbons [14] of six autopsy cases, in all of which there was some invasion of the gland capsule, and in three invasion of adjacent structures, bone and veins. A similar finding is reported by Dietrich [11] in Hodgkins' disease. Such invasive growths have also been found in chronic leukocytic leukemia by Lehndorff and others. Lehndorff, [8] for instance, describes a lympho-sarcoma of the anterior-mediastinal lymph glands and thymus, invading the pericardium, left pleura and lung, showing lymphocytic blood. And it is this coincidence of leukemic blood and undoubted sarcomatous growths in the lymph glands, in which, however, the structure of lymph gland is still imitated, that justifies the conception of leuko-sarcoma.

Fabian, Naegle, and Schatiloff [6] do not write of lymphatic leukemia as malignant. But in the protocols of eight cases the capsules of the glands have been invaded in six. They acknowledge that there are forms of leukemia with partial lymphosarcomatous-like growths. The invasive character in the case of myelocytic leukemia is not so easy of demonstration, though this too has been claimed, for instance by Banti. And even though the capsule of the involved organ has not been invaded aggressively, the destruction of certain parts of the organ, such as the lymph follicles of the spleen, the thymus follicles, the fat of the marrow by myeloid cells, has been repeatedly noted.

There can be no doubt, then, from pathological evidence that all gradations occur between distinct sarcomatous growths, such as lympho-sarcomas, and the ordinary leukemic growth, the lymphomas. And the same gradations are seen between sarcomatous growths, such as leuko-sarcoma, and pseudo-leukemia. Between leukocytic leukemia and myelocytic leukemia, and between leukocytic leukemia and pseudo-leukemia, there are the same easy gradations. The unity of the group can hardly be questioned.

From the clinical standpoint the malignant nature of the leukemia is somewhat more apparent. We usually see a progressive and chronic cachexia of insidious onset, the cause of which is not known. Fatal in a few months or from three to five years. In this long course the cachexia, whether caused by toxemia or not, is certainly not accompanied by the symptom complex of fever. Nor is it accompanied by pus, nor caseous formations. In the later stages with pronounced anemia, fever commonly occurs; but for years the disease may progress slowly without fever.

Physical examination of the patient, or the history of the patient, gives no clue to infectious processes in organs outside the ones directly involved. This is in distinction to the ordinary infective granulatoma, i. e., actinomyocosis syphilis, and tuberculosis.

As if the very progress of the disease were proportionate to the growth-energy of the cell, the younger the patient the worse the prognosis. M of the acute cases have been found in children. In forty-eight cases of lymphocytic leukemia, in Cabot's [1] series, not a single acute case occurred after the age of fifty-one. A patient of mine, now sixty-six years of age with myelocytic leukemia, has had the disease for over three and one-half years. A man who died at the age of fifty-six years of lymphocytic leukemia, observed by Fabian, had had the disease for eight years. [6]

The various therapeutic agents of value in the process have also been known to act favorably in cases of undoubted malignancy. It has long been known that after an intercurrent infection, from which the leukemic patient recovers, there is temporary improvement, commonly seen, for instance, after such acute diseases as influenza, follicular tonsilitis, acute laryngitis. Taking this cue from nature, the attempt has been made with more or less success to inject various toxins into the patient. This has been followed by only slightly encouraging results. Koch's old tuberculin in large doses, as much as eighty milligrams at one dose, with or without arsenic, has been used. [16] Larrabee [17] has used the mixed toxins of Coley (streptococci and prodogiosus) and also killed colon bacilli cultures. Nothing as effectual as the X-ray has, however, been found.

Now, the improvement of an infectious disease by the simultaneous occurrence of another infectious disease is a phenomenon unknown to us; on the contrary, we protect even our chronic infection cases as much as possible from other infections. It is true that the diphtheretic membrane in the throat has been smeared with products obtained from pyocyaneous cultures because of its desired digestive action, and yeast has been used in treating different pyogenic and gonorrheal infections; both of these, however, are instances of local action, and both organisms are ordinarily of low virulence. But in true cases of malignant disease, intercurrent infections, and also the introduction of toxins, have been known to work a beneficial change. Cancer has, for instance, been known to improve even to the point of spontaneous recovery after such infections. [23] Coley's mixed toxin has been known to help in the treatment of sarcoma.

In the X-ray we have the most potent agent in the treatment of leukemia. After its use one of my patients with myelocytic leukemia was practically well for thirteen months. Though doubted in some quarters, [27] it is generally accepted that this action is associated with the production within the patient's body of a leukolytic body or bodies. So that the serum from such a patient, injected into a patient not under X-ray treatment, will cause a drop in the number of white cells. Eventually, however, the patient receiving the injection, and also the patient

receiving the X-ray, seem to develop immunity, and the favorable action wears off. [21-28] On cancer, X-ray acts beneficially, superficial epitheliomas, it causes to disappear in about 66 per cent. Deeper lying cancers are not nearly so often favorably influenced, but ulcerations are healed, pain reduced, and the tumor lessened in size. Sarcoma and even lympho-sarcoma of the deeper parts have been similarly cured or alleviated. Indeed it is in such rich cellular tissue with lessened stroma and rapidly growing, that we would anticipate a favorable action from X-ray. [22]

Rather as a corollary, one considers the blood picture in this group of diseases; ordinarily malignancy runs without leukemic blood findings, so that the blood picture which we see in leukemia rather influences us in believing that we are dealing with different phenomena. One does well, however, to believe with Lehndorff, [8] who states that too much importance has been attached to the blood findings. He states that a symptomatic leukemic blood may occur besides the ordinary form, for it is undoubted that sarcomatous cases have been observed with leukemic blood (leukemia sarcomatosa; lympho-sarcomatosis-leukemica). The blood changes are rather accidental, clinically interesting and important. Two great pathologic groups occur associated with lymphocytosis, pure hyperplastic leukemia and leuko-sarcomatosis. His case, already cited in speaking of invasive growth, is in strong contrast with Gibbons' cases, without leukemic blood.

The question of how much importance to attach to the blood picture particularly concerns acute leukemia; for neither the clinical picture of this disease nor the pathological findings in many reported cases resemble malignancy. And the effort to explain leukemias as malignant diseases, is somewhat weakened if we attempt to explain the acute cases on the same basis. Undoubtedly some of the reported cases represent terminal and secondary infections occurring in the course of chronic leukemia; many, for instance, have shown endocarditis or pleurisy.

Cases of acute leukemia running a typhoidal temperature, with little if any enlargement of lymph glands or spleen, with severe inflammation of the mouth and pharynx, oftentimes of a few days to a few weeks' duration, always under nine weeks according to Ebstein's arbitrary limit these cases do not resemble closely the ordinary chronic leukemia, but resemble rather an infectious disease of the bone marrow, as noted by Emerson. [12] This view of acute leukemia, that acute leukemia is a different disease from the chronic form, and that one is not justified as regarding them as the same, because of the leukemic blood found in both, is held by several writers, Bradford, Barlow, Osler, indicating the fact that the blood picture is not necessarily pathognomonic.

Then, too, in many cases the blood picture changes; in the presence of a severe, acute, complicating infection the leukocytes rapidly fall. In one case of myelocytic leukemia ending with miliary

tuberculosis, we observed a drop from 300,000 to 6,000 cells in five weeks. Seen during the latter period, the exact diagnosis from the blood alone is impossible from aplastic anemia or Hodgkins' disease. Other reasons also can be given which rather detract from the importance of the blood picture in this group of diseases. Certain cases have been described in which, with leukemic blood, leukemia was certainly not present. Simon, [29] for instance, found such blood with multiple fracture of the leg, and as these fractures healed, the blood picture became normal and stayed so. As early as 1868 Mursick [30] described a case of leukemia developing five days after amputation at the knees following gunshot wound. Section showed osteo-myelitis. We are inclined to think that some of the cases attributed by Ebstein to trauma can be explained on this basis. In fact, myelocytes may enter the blood in numbers in various conditions accompanied with myeloid change in the marrow, lymph glands or spleen, thus giving a high leukocyte count and resembling myelocytic leukemia. This picture may be obtained in some cases of diphtheria and scarlet fever, or in very severe anemias from any cause.

The blood picture of chronic lymphocytic leukemia is seen in pertusses in which the leukocytes may vary from 20,000 to 40,000, the main increase being in the lymphocytes. Congenital syphilis has been known to imitate very closely the same picture. Finally, it must be granted that ordinary sarcoma may be accompanied by the blood picture of leukemia, even when the bone marrow is shown to be normal.

All in all, then, we feel like accenting the statement that the ordinary blood picture of the chronic leukemias as we now understand it has been observed in other conditions, and the converse is likewise too; for leukemia has been repeatedly proven at the bedside and autopsy table minus the usual blood picture.

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Discussion.

Dr. Henry Walter Gibbons: In connection with the paper of Dr. Harris, I will show three slides from cases of Hodgkin's disease, of which I made a study several years ago. At this time an important article appeared by Dr. Reed, which seemed to prove conclusively that Hodgkin's disease, tuberculosis and syphilis of the lymph glands are distinct diseases. But Dr. Reed took the view that the lesions of Hodgkin's disease are due to a reaction in the tissues in the nature of a chronic inflammatory process. This view was held by Longcope and Simmons who wrote articles confirming Reed's views. Our study led to the view that Hodgkin's disease is to be classed with malignant tumors. I have brought several slides which illustrate some of the points which lead to the conclusion that this is a malignant process. In this slide taken from one enlarged gland note the picture presented, structure of lymph gland destroyed, proliferation of connective tissue, proliferation and enlargement of the endothelial cells, the large size of the lymphocytes, and the peculiar giant cells. A picture that resembles a sarcoma much more than any of the inflammatory granulomata. This slide shows infiltration of the gland capsule by the cellular mass within, which is seen breaking through the capsule in one place. Here is seen a metastatic nodule in the periportal tissue of the liver. It is infiltrating the wall of a vein and extending into its lumen. This condition was observed by Reed and Simmons. Another section shows a metastatic nodule in the lung, of the same characteristics, and existing where no normal lymphadenoid tissue has ever been found. Since Dr. Reed's paper the pendulum has been swinging and more and more Hodgkin's disease is being regarded as a malignant disease. Coley, with his vast study of sarcomas, has come to believe this way. Banti and Dock are adherents. The recent text books are more conservative with the exception of Adami, who admits of no grounds for considering Hodgkin's disease other than an inflammatory process. The cases which we studied are clinically and histiologically Hodgkin's disease, while two had tumors of a decided malignant nature. This led to the conclusion that Hodgkin's disease and lymphosarcoma are allied, if not stages of the same process. My work did not extend to all the diseases discussed by Dr. Harris, but it is interesting to note the tendency in the classification of these diseases. Dr. Harris is to be commended upon the great amount of work he has done and the great number of authorities he has consulted in prefacing his interesting paper, and his conclusions are evidently derived from the latest and best work done upon the subject.

Dr. Hanson: I remember seeing lately that Forchheimer has written an article with regard to the treatment of this disease, which would follow out the lines under discussion. He uses four or five or six different remedies, including iron and arsenic and particularly X-ray, giving the foremost place to the X-ray treatment. In connection with this matter, he states that it has never been within his knowledge that a case of leukemia has been cured.

Dr. Harris (closing): The fact that leukemia is such a hopeless disease in itself, so far as treatment goes, is another analogous point to the malignant diseases. The other diseases are not included because they seem to be different. Pernicious anemia, both with its blood picture and changes in the marrow, has been experimentally reproduced by injections of ricin and there is a great deal to make us believe that it is an auto-intoxication. There is no essential production of new cells. The great heaping up of cells in the tissue such as we see in the spleen in leukemia is not seen in pernicious anemia. Leukanemia seems to be an atypical form of leukemia, so this classification would include them all.

THE INFLUENCE OF CLIMATE UPON TUBERCULOSIS; WITH REMARKS ON THE CLIMATE OF COLFAX, CALIFORNIA.*

By ROBERT A. PEERS, M. D., Colfax.

Mr. Chairman and Gentlemen: Your Chairman of the Committee of Arrangements, Dr. Phillip King Brown, suggested that, in addressing you on the subject of tuberculosis, I refer to our Colfax climate in such cases. It had been my intention to write upon "The Early Diagnosis of Tuberculosis," or upon "The Study and Prevention of Tuberculosis"; but after receiving his suggestion I thought perhaps it might be of interest to the members of this Association to present to them not only a few facts relative to Colfax and its climate, the inducements it presents, and also the disadvantages it offers to the tuberculous, but also to make mention of a few observations made by me during the time that I have been paying particular attention to the study of tuberculosis and the treatment of the tuberculous.

But before speaking of the climate of Colfax and vicinity, I would like to say a few words as to the part climate plays in the treatment of tuberculosis. For centuries certain localities were supposed to possess almost specific curative powers for the tuberculous and from very early times patients with consumption were sent to such localities; and even to-day among the laity, and also a large part of the medical profession, the first thought when it is discovered that a patient has tuberculosis is, "Where shall he be sent?" On the contrary, there are many men who would go to the other extreme and claim that a tuberculous patient will do as well in one locality as in another. It is but another case of the pendulum having swung too far in the other direction. Most men, however, who have studied the question of climate in its relation to the treatment of tuberculosis are agreed, I think, that, while climate plays an important part, it is really secondary to other considerations, and that its value should not be allowed to overshadow other and more important factors, as, for example, a well-regulated daily routine and competent medical supervision. Speaking on this subject, Knopf[1] of New York says: "I do not deny the beneficial influence of certain climatic conditions on the various forms of phthisis, but I do not believe that there exists any climate with a specific curative quality for any kind

of pulmonary tuberculosis. Climate can be considered only a more or less valuable adjuvant in the treatment of consumption, but not a specific."

Sir Hermann Weber,[2] in an address before the Tuberculosis Congress at Berlin in 1899, after giving numerous indications as to choice of climate for pulmonary invalids, remarked: "The cure of tuberculosis during the early stages is possible in all climates. But climate itself, without careful medical supervision, is generally insufficient. The patient's blind reliance on the climate often leads to errors, to aggravation of the disease, and to death."

Dr. Lawrason Brown, of Saranac Lake, quotes Sandwich,[3] who says: "Every man who lives in a health resort becomes early inoculated with the microbe—I do not know its Latin name—but it means the microbe of universal belief in the place in which he lives." Lawrason Brown[4] himself says: "There is no specific climate for pulmonary tuberculosis, and a good climate alone is of no avail. . . . Without doubt many of the effects attributed to climate can be ascribed to change of climate. Change from a 'good' to a 'bad' climate often produces excellent results." He also says: "The ideal place for a patient with pulmonary tuberculosis should possess purity of air, a dry, porous, salubrious soil, good potable water in sufficient quantities, good sewage disposal, relative protection from winds, and such a temperature that a patient can spend hours out of doors without discomfort. Abundant sunshine, infrequence of fogs, the persistence of snow, if it occur throughout the winter, are all of value."

Burton Fanning,[5] in his work on "The Open Air Treatment of Pulmonary Tuberculosis," writes: "The exact regulation of the patient's daily life is the essential point in treatment, and the precise climatic conditions under which the proper life is led are a consideration of secondary importance." He is led to make the above remarks after telling that "the most diverse climatic conditions are recommended for the same form of the disease, and the curious spectacle is witnessed of the patient from the East being sent to the West, and the dweller in the West being ordered to the East."

Latham,[6] in his work on "Diagnosis and Modern Treatment of Pulmonary Consumption," quotes Osler, who points out that "in the Blood Indian Reserve of the Canadian Northwest Territories there were, excluding diseases of infancy, 127 deaths —or 23 per cent of the total rate—from pulmonary consumption during six years in a population of about 2,000, and that in a tribe living in one of the finest climates of the world—at the foothills of the Rocky Mountains." If your time and patience would permit I might quote you many others who agree with those already quoted that climate, while a valuable adjunct, must not be allowed to usurp the place rightly held by hygiene, diet, teaching and supervision.

But while granting other measures their proper place, we must not deny that climate, or change of climate, if you will, does have a marked effect upon tuberculous patients. "To the observer in the health resort," says Minor,[7] "the evidences of the beneficial effects of climate are so many and so apparently irrefutable; he so constantly has occasion to see them and to be convinced of their reality, that he has difficulty in understanding how they can be doubted." And again, speaking of the effect of climate on advanced cases and those with mixed infections, he says: "They far surpass the very best results obtainable in similar advanced cases in our cities on porches or roof gardens, and the rapid relapses which in such advanced cases follow their return to ordinary climates are only another testimony in the same direction." That the above remarks are true has been proven to me many times by cases coming under my personal supervision. It is a not infrequent occurrence to see a patient who, at home with good medical attention, was going down hill steadily, come to the foothills and commence at once to gain both appetite and weight; while the manner in which the cough and expectoration lessen, the night sweats cease, and the patient takes on a feeling of general wellbeing seems at times almost marvelous. Only too many of them, however, either against advice or without it, return to their old environment and climate only to relapse sooner or later.

Granting, then, that although certain climates exert a favorable influence upon the course of tuberculosis, they are really of secondary importance, we will proceed to discuss some of the favorable and unfavorable features of Colfax as seen by me. I intend to discuss the unfavorable features, because no climate or location is ideal, and I think that a fairminded portrayal of the climatic conditions (so far as one can do so) is the only course open to any member of the profession, and it is only by giving you complete details that you are enabled to decide whether or not you wish to send your tuberculous patients to such a climate and location.

Colfax is a town of about 500 or 600 inhabitants, situated in the foothills of the Sierras, in Placer county, on the main line of the Southern Pacific Railroad, 144 miles east of San Francisco, and is a junction town, being one of the termini of the Nevada County Narrow Gauge Railroad to Grass Valley and Nevada City. It has a postoffice, express, telegraph and long distance telephone stations, and has as good railroad facilities as any town between Sacramento and Reno, all trains being required to stop for inspection. It has a good public school of nine grades with three teachers. There are two churches, Roman Catholic and Methodist Episcopal, a bank, three general stores, two dry goods stores, a good butcher shop, and a first class drug store. There are three good hotels, all lighted by electricity, where rooms can be obtained with baths, hot and cold water, call bells, and all serving good wholesome meals at reasonable rates. The charges range from $8.00 to $17.00 per week. I make mention of the telephone, telegraph, express and railroad facilities, together with facts relative to bank, churches, and schools because they all have their bearing upon the subject. They may seem but small details but it is the attention to the small

details and the little conveniences that frequently makes the difference between success and failure in the treatment of tuberculosis. The importance of good stores, butcher shop, and drug store is obvious. I mention the hotels because it is necessary that the tuberculous patient and his friends should have somewhere to stay while looking for more permanent quarters. As permanent quarters for the tuberculous, hotels, as a general rule, are unsatisfactory, there being too much noise, too many temptations to relax on discipline, and an inability to supervise the menu to the extent possible in private houses. Hotels are primarily for the well and for these Colfax possesses first-class accommodations.

The elevation of Colfax is 2422 feet, practically the same as Tucson, Arizona, and Liberty, N. Y. It is high enough to escape fogs, there being very few days in the year that are foggy, so that nearly every day when rain is not falling is a day of sunshine. It is also below the snow line, very little snow falling during the year. This, of course, is not so important as the absence of fog.

The climate itself is such that one can live the out-door life during the entire year without discomfort. That, in my mind, is of more importance than exactly how warm or how cold the weather is, or the presence of fog, snow, rain or sunshine. While there is no doubt that patients can spend the entire day out of doors even during the rigorous Eastern winters, the many discomforts attached thereto and the precautions to be taken render such a life one requiring much self-denial. The climate, which allows the maximum number of hours in the open air, with the least physical discomfort approaches, I think, all other things being equal, more nearly the ideal than any other. In order to be able to speak positively on the matter I have prepared a table showing the average temperature of Colfax at 2 p. m. during a period of seven years, and also the average temperature for 7 a. m., and 9 p. m. for a period of three years. These tables are based on calculations made from records taken by Mr. Morris Lobner, Southern Pacific agent at Colfax, being collected by him for the State of California. Glancing at the table we see that the average temperature for the three years was at 7 a. m. 54.6° F.; for seven years at 2 p. m. it was 69.1°, and for three years at 9 p. m. it was 57.6°. Lack of time prevented me from making all calculations for a period of seven years.

Table No. 2 shows the relative humidity calculated from readings in the dry and wet bulbs at 2 p. m. for a period of one year. Owing to the great amount of labor involved in personally figuring out the relative humidity by aid of Glaisher's table and the table of Tensions I can give you the humidity for only one year and for one reading only during the day. According to the table presented the average relative humidity was 47.7%. I have here also table No. 3, which gives the rainfall during a period of seven years and shows the annual precipitation to be 47.062 inches.

Any place where invalids are sent to recuperate should have plenty of good water for domestic and other purposes. Being situated in the Sierras with two large ditches bringing water from the mountains, and with a number of local companies supplying water, obtained from tunnels which tap a mountain behind the town, Colfax has plenty of water for domestic purposes. There is in contemplation at the present time, the construction by the South Yuba Company, of a large reservoir behind and above the town which when completed will give Colfax a most abundant supply of water for all purposes.

Every climate and location has its disadvantages and Colfax is no exception. Those that I would mention are four in number: first Colfax is not an incorporated town. This, of course, is a disadvantage in the matter of enforcing health laws; but we have carried on such a campaign of education in the matter of tuberculosis that any patient suffering from that disease seen expectorating in forbidden places would very soon be enlightened as to his duty toward his fellow men. As to the activity of our health officer along other lines I can refer you to Dr. N. K. Foster.

Second: Colfax has no town sewer system. This is to be regretted but it is expected that with incorporation, which we look forward to within the next year, that we will also have proper sewerage.

Third: We have no herd of tuberculin-tested cows. This will come as a result of further education of the people on these matters and with the passage of State laws. However, I will say the cattle are in the open air practically all of the time, that the dairies are well kept, and the milk supplied is of excellent quality.

Fourth: There is no boarding-house under the care of a person experienced in cooking for and caring for tuberculous patients. We need more people to cater to the wants of the tuberculous who understand thoroughly and practice daily the gospel of fresh air, hygiene, proper diet, rest, and other essentials for the cure of tuberculosis. To overcome this difficulty I have secured permission from the owner of a tract of fifteen acres, to erect cottages which can be leased to patients for $10.00 per month. The location of these grounds is on the edge of the town, protected on the north by a high mountain and commanding a beautiful view of magnificent mountain scenery. For any one who has a nurse, or relative, to cook for and wait on him, and who is willing to place himself under direct medical supervision, the owner of the land will build a model cottage according to plans furnished by me and copied from similar buildings observed by me at Saranac Lake, Gravenhurst, and other places. We have two such cottages at present and we expect to add more in the near future.

Before closing I would like to make a statement regarding the freedom of the townspeople from tuberculosis. In the past twenty-two years there have been but three deaths from tuberculosis among the regular inhabitants of Colfax. This I gained from the records of the undertaking establishment. You may say that many deaths may have been wrongly registered but I can state positively that

in the nine years in which I have lived in Colfax there has been but one death from tuberculosis among those who were permanent residents, and had lived in Colfax for five years prior to death.

In closing I would like to enumerate a few points that have been forced upon me during my residence in Colfax.

First: With proper care as to hygiene, diet, rest, and supervision, patients with incipient tuberculosis will, in the majority of cases, recover in almost any climate. Such a case will, however, make more rapid recovery if sent to some health resort, where the above-mentioned care can be obtained, and not a little of the benefit thus derived is due to the change of surroundings, instead of to the climate itself.

Second: You had better keep your tuberculous patient at home, under your own care, no matter how unsatisfactory the climate, rather than send him to the best climate in the world and allow him to shift for himself. Every tuberculous patient requires medical care as much as a case of typhoid fever. Many cases of typhoid would recover without a physician, but that is no argument in favor of neglecting to furnish a typhoid patient medical attendance. The same holds good for tuberculosis. That the patient is without means to employ a physician is no excuse, because any doctor will take care of such an one free of charge if he has but a word from the family physician.

Third: Never send a patient to a health resort who has not sufficient means to support himself without work or worry for several months. Your patient would be better at home in a trying climate with the little luxuries and comforts that could perhaps be purchased, than to be sent to an ideal climate and not have sufficient means to live comfortably.

Fourth: Never send a tuberculous patient to the mountains with advice to "Get out in the open air and rough it." That advice is daily given to such patients and is daily killing them.

Fifth: Never send your tuberculous patient away with the idea that he has stomach trouble, bronchitis, throat trouble, or even weak lungs. Tell him he has tuberculosis of the lungs, that it is a preventable disease, and frequently curable if taken early and proper measures adopted. If you do that you will not scare your patient to death and you will prevent his hating you when he finds out the real trouble. It will also increase his chances of recovery fifty per cent.

Sixth: Never send a patient with fever to a resort without sending a nurse or attendant with him, because a fever patient should be in bed the same as a patient with pneumonia or any other febrile disease. Better still, keep your patient in bed at home until his temperature drops before sending him away. I have at the present time two patients with tuberculosis, one of whom has been in bed four months, and the other three months. They were both advanced cases with persistent fever. The temperature of one is now normal and he is taking carefully regulated exercise. The temperature of the other still persists and I shall keep him in bed

till Christmas if necessary or until there seems to be no hope of recovery. These, of course, are extreme cases, and the temperature usually drops in from one to four weeks.

Seventh: Patients with the disease so far advanced as to be practically hopeless should not be sent away at all. Many cases are sent from home to whom the railroad journey and the separation from friends and home is a positive cruelty and only hastens the end. On the other hand, many advanced cases and cases with mixed infection find the trip to a health resort a means of prolonging their lives several years and enabling them to live in comparative comfort.

Eighth: If you have a patient who will not conform to discipline, or who is too lightminded to understand the serious nature of the disease and the necessity of a carefully regulated life, do not send him to an open health resort, but to a sanatorium where he will have to do as he is told, whether he wishes to or not, and whether or not he realizes the necessity of proper living.

And finally, I would say that in the fight against the great white plague, one of the most potent— perhaps I would not be far wrong if I said the most potent—of all factors is money. The old saying that "A rich man may recover from consumption, a poor man never," is no longer true, thanks to better means of diagnosis, better methods of treatment, and the aid of many State and charitable institutions; but, nevertheless, what is needed most is money—money for sanatoria and dispensaries for the poor, money for educational purposes, and money for the individual patient to carry him over the period of forced inactivity, and without which climate or the other aids will be of little avail.

References.

1. Knopf, Twentieth Century Practice of Medicine, p. 330, Vol. XX.

2. Weber, quoted by Knopf, Twentieth Century Practice of Medicine, p. 331, Vol. XX.

3. Sandwich, Lawrason Brown—Osler's Modern Medicine, Vol. III, p. 391.

4. Lawrason Brown—Osler's Modern Medicine, Vol. III, p. 392.

5. Burton Fanning—The Open Air Treatment of Pulmonary Tuberculosis, p. 159.

6. Latham—Diagnosis and Modern Treatment of Pulmonary Consumption, p. 167.

7. Report of the Committee on the Influence of Climate in Pulmonary Tuberculosis—before the National Association for the study and prevention of Tuberculosis, Washington, D. C., 1905.

Average daily temperature of Colfax, California.

Taken at 7 a. m. and 9 p. m. for a period of 3 years.
Taken at 2 p. m. for a period of 7 years.

Month	7 a. m.	2 p. m.	9 p. m.
Jan	42.5	52.7	45.9
Feb.	41.7	51.9	43.2
March	44.3	55.7	46.8
April	48.6	64.0	53.5
May	59.4	72.6	58.1
June	67.8	82.6	68.6
July	72.4	89.7	75.9
Aug.	71.8	89.2	74.1
Sept.	62.2	82.9	66.9
Oct.	55.0	73.9	59.5
Nov.	45.6	59.8	48.9
Dec.	42.3	53.9	45.2
Average	54.5	69.1	57.6

From readings taken each day at 2 p. m. from the dry and wet bulbs, calculated by aid of Glaisher's Table and Table of Tensions.

Mean Relative Humidity by Months for Colfax.

	Per ct.
January	60.4
February	67.8
March	61.1
April	51.8
May	53.1
June	32.3
July	28.4
August	24.9
September	30.9
October	34.4
November	57.4
December	69.5
Average	47.7

Rainfall during year, 44.425 inches.—Average, 47.062
From records in possession of Mr. Morris Lobner, S. P. Co.'s agent at Colfax.

Mean Temperature of Colfax, Taken at 2 p. m., for Months and Years.

Month.	1870	1871	1872	1873	1874	1875	1876	Avr.
Jan. ..	not obt'n'ble	55.6	54.0	57.9	49.9	51.9	47.1	52.7
Feb. ..	52.2	50.7	53.0	46.8	49.6	57.5	53.9	51.9
Mar. ..	52.3	56.5	58.4	63.6	48.6	56.5	54.3	55.7
Apr. ..	64.1	66.6	59.6	64.1	62.6	68.6	62.6	64.0
May ..	70.2	69.9	76.6	74.1	70.9	74.8	71.5	72.6
June ..	79.8	86.2	81.6	83.6	79.7	79.8	87.5	82.6
July ..	89.3	90.0	89.7	91.2	90.3	91.1	86.0	89.7
Aug. ..	87.1	94.9	92.1	89.7	85.3	89.5	85.9	89.2
Sept. .	79.4	85.0	82.4	85.7	84.0	84.9	79.5	82.9
Oct. ..	71.5	76.5	75.9	75.1	67.5	82.6	67.9	73.9
Nov. ..	61.5	58.2	60.8	66.5	56.2	55.7	not obt'n'ble	59.8
Dec. ..	52.4	55.0	56.6	46.9	55.6	57.0	not obt'n'ble	53.9

Average daily temp. at 2 p. m. for 7 years, 69.1.
Highest temp. in 7 years, 107.5—July, (2 p. m.)
Lowest temp. in 7 years, 32—Dec. (2 p. m.)
Number of times temp. reached 100 or over—26 times or 3.7 each year.
(From records in possession of Mr. M. Lobner, Colfax.)

Precipitation in Colfax.

Month	1870	1871	1872	1873	1874	1875	1876	Total	Average
Jan.	11.646	14.670	20.520	2.870	10.630	12.320	8.870	81.526	11.646
Feb.	8.450	3.145	13.680	9.620	5.720	0.190	6.800	47.605	6.801
Mar.	5.410	4.305	4.690	1.240	8.930	12.090	3.030	39.685	5.669
Apr.	5.100	4.030	3.400	1.810	3.430	0.000	3.230	21.000	3.000
May	.250	0.610	2.040	1.310	0.000	1.020	9.305	9.305	1.329
June	0.020	0.400	0.000	1.220	1.900	2.450	0.364	2.450	0.364
July	0.130	0.000	0.000	0.000	0.000	0.460	0.066	0.460	0.066
Aug.	0.000	0.000	0.000	0.000	0.000	0.020	0.003	0.020	0.003
Sept.	0.010	0.010	0.000	0.000	0.010	7.980	1.140	7.980	1.140
Oct.	0.000	0.520	2.270	3.360	0.950	1.207	1.207	8.447	1.207
Nov.	1.210	0.620	0.580	13.790	14.840	7.258	7.258	50.808	7.258
Dec.	3.790	4.870	3.990	13.730	0.950	7.100	8.592	60.147	8.592
Average	7.435	9.800	15.640	1.150	0.000	57.507	329.433	47.062	

(From records in possession of Mr. Morris Lobner, S. P. Co.'s Agent at Colfax.)

Discussion.

Dr. Keys: There have been two points of which I want to speak, and one is the matter of not sending a patient to a resort with the idea of having him rough it, and the other thing is the matter of absolute rest for these tuberculous patients. I have just received a letter from a patient, unfortunately taken with tuberculosis, now in Switzerland, and he writes that the patients there are put to bed after a thorough examination, and are told that their clothing is locked up and that they will not be allowed to see it until their temperatures are within one-half a degree of normal. The main features of the treatment are food in plenty, an absolute out-of-doors life although in bed, and absolute rest. These things are essential to the tuberculous patient.

Dr. Peers, closing: In conclusion, I will cite one case, showing how some patients are wrongly sent to health resorts. A young fellow last fall came to my office with an advanced tuberculosis. He said that he had been sent from Pennsylvania, that he had no money except a few dollars, and that he had been sent away from Pennsylvania, where he could have been lodged in a free sanatorium and have been kept by the state, and where he could have recovered his health. He lived in my neighborhood a few weeks, when I told him that he would do just as well with his sister, where he could go to bed and have some attention. If this had been done in the first place it might have been sufficient. It shows you how some people place a blind reliance on climate and location, where really the change with the idea of roughing it and working their way, really means their death.

WAXED SILK AS A SUTURE.*
By C. E. THOMPSON, M. D., Dunsmuir.

I wish very briefly to present for your consideration a method of preparing silk which in my hands has proven highly satisfactory.

The value of waxed silk for suture purposes, was first brought to my attention about ten years ago by a brief statement in a medical journal, so I do not claim originality in this method; but as I have not found any other surgeon using such sutures as a routine nor have I heard the subject brought up in a society, I thought a few remarks regarding it might prove of interest and bring to your attention a very useful preparation in suture work.

The technic of waxing the silk is not of very great importance so long as the silk is perfectly sterile and is thoroughly saturated with sterile wax, the melting point of which is considerably above the temperature of the body.

My usual procedure is to drop the card of silk into boiling water to sterilize both the silk and card; they are then taken out, lightly dried on a towel and then dropped into a boiling mixture of equal parts of white wax and paraffin, containing one per cent each of carbolic acid and salicylic acid. I do not know that the acids are combined in the best proportions or that they are of any great importance in the wax but theoretically they ought to inhibit the development of any germs that might be in the silk or wax or in the tissues with which they are in contact.

In a perfectly sterile field of operation the wax alone might be less irritating, but in very few cases do we find ideal conditions and I have always added the acids on this account.

After boiling a few moments all the moisture contained in the silk and card are driven off and replaced by the wax, the card is then removed and, when cold, is placed in an envelope where it remains until wanted.

* Read before the Pacific Association of Railway Surgeons.

I have preferred to use the prepared silk on glass spools and kept in alcohol. The latter is poured off, and after the spools have thoroughly boiled in the wax they are replaced in the bottle as before except that they are kept dry; in this way it is more convenient to handle and less liable to contamination.

I have experimented with different proportions of wax and paraffin and think when combined in about equal parts the best result is obtained. If too much pariffin is used the thread fibre does not cohere sufficiently to prevent capillary attraction, and the thread is not so pliable nor does the first knot seem to hold so well in tying. If too great a proportion of wax is used the thread fiber retains too much wax and the thread is apparently made larger and troublesome in drawing through the eye of the needle; I think also that the wax alone is more liable to be affected either by chemical or physiological processes, than when it is combined with pariffin in considerable proportion.

The temperature of the mixture when boiling is about 350 degrees and I think it is safe to assume that any germ or spore that might escape such a temperature would be too weak to burrow out of the wax and paraffin after they had been incorporated with the thread fiber.

I use the twisted thread in preference to braided, for when dipped in hot water before threading a needle, and by rolling it between the finger and thumb the thread is made quite small and can be twisted to a fine point; it is then very easily threaded into a much finer needle than could otherwise be used; this advantage alone is worth the trouble of waxing to the general practitioner, who has to do much emergency work and is called upon to use sutures under all kinds of unfavorable surroundings; the fine needle rendering the operation decidedly less difficult to perform besides being less painful and making smaller stitch holes, all of which are deserving of consideration by the surgeon and appreciated by the patient.

Prepared in this way I believe silk to be superior to any other material we possess where a non-absorbable suture can be used. When they are buried I believe they are less likely to cause trouble than plan silk or poorly prepared catgut, and in the cases where I have so used them there has been no after trouble. It has most all of the advantages of silver wire, horsehair and silkworm gut with none of their disadvantages.

Waxed silk is especially valuable for use in closing wounds about the face and hands; it is often impossible entirely to prevent infection in such injuries and I have frequently removed the sutures from an infected wound and found the stitch holes not infected while the wound is bathed with pus, seeming to prove both the absence of capillarity and an inhibitory influence on germ development.

Another advantage over plain silk is that blood, pus, secretions or dressings do not easily adhere to the waxed thread and so you are not liable to tear out your sutures when you take off the dressings.

To sum up then, the advantages claimed for waxed silk are:

Its sterility and the ease of keeping it sterile.

The absence of capillary attraction.

It does not irritate the tissues.

Does not adhere to the tissues, dressings or secretions.

It is easily removed.

Easily prepared.

Convenient to carry, easy to thread and in tying it the knot does not slip so easily as plain silk.

Discussion.

Dr. Teass: This proposition of suturing to me has become a very simple matter. I can remember a few years back in doing surgery when I carried a grip around with me with every material necessary in it. As my experience progressed this has become much more simplified and to-day is a very simple matter. I simply take a few tubes of sterile catgut of various sizes and silkworm gut. I put them in a wide-mouthed bottle and fill it with tincture of iodine. I take it out and place it in hot lysol. The proposition of sterilizing silk is something I never attempt. I do not use the silk gut at all even as a buried suture. I have resorted altogether to catgut within the past few years. I can remember when I first attempted suturing with silk I had many cases of stitch hole abscesses but within the last few years I cannot recall a single case of stitch hole abscess even in those cases where there had been no previous preparation at all and I have had many scalp wounds and dirty wounds which are hurriedly cleaned out and a suture put in with very clean results.

SIMPLIFICATION OF THE TECHNIC OF THE SERUM DIAGNOSIS OF SYPHILIS.

By J. N. FORCE, M. D., Berkeley.

In the article which he has devoted in this journal to the technic of the different procedures employed for the serum diagnosis of syphilis, M. Fornet concludes that (the execution of the method of Wassermann presenting some difficulties), he désired that the examinations be practiced with all the guaranties of exactness by State laboratories, which would centralize them, and would put their results freely at the disposal of practitioners. It cannot be denied that the method of Wassermann is neither easy to learn or to apply, and its author himself declared, recently, before the Medical Society of Berlin that its technic was complicated. For these reasons, since the publication of the work of Wassermann, I have sought for, and finally found a method simpler and more rational. I explained its general principles some months ago, and its practical value has now been verified by numerous applications made by me and other workers. It is the technic of this method that I am going to explain for the first time, with all the necessary details, so that, simplified, as I have made it, the serum diagnosis of syphilis can now be carried out without any difficulty by all physicians desirous of using the latest gifts of science.

In order to practice serum diagnosis of syphilis, one needs fresh guinea pig serum, a five per cent suspension of sheep corpuscles, normal human serum, extract of an organ, and serum of the patient.

Fresh guinea pig serum. It is obtained by bleeding from the carotid or femoral. If only a small quantity is needed it can be taken from the heart with a small exploring needle, without killing the animal. Detach the clot which forms in the vessel and draw off the serum with a pipette. This serum

(Translated from La Semaine Médicale.)

does not keep more than a day, unless frozen. In this case liquefy, at the moment of using, with a little tepid water. This can only be done once. In using the serum dilute to 1-10 with normal salt solution.

Five per cent suspension of sheep corpuscles. Procure some fresh sheep's blood that is received in a bottle containing iron filings, to prevent clotting, and shaken for ten minutes. At the laboratory decant through a sieve into the tube of a centrifuge, note the height; then centrifuge. Draw off the serum with a pipette and refill to the mark with normal salt solution, shake and again centrifuge; repeat twice and finally fill with normal salt solution to the mark. This diluted to five per cent can be kept on ice several days.

Normal human serum. This can be obtained by puncture of a vein. I prefer placental blood. Heat in a water bath for a half hour at a temperature of 51 to 56 degrees to destroy the complement.

Organic extract. Rub together in a mortar 100 c. c. of alcohol at 96 degrees and 10 gms. of the liver of a syphilitic fetus (I have employed with equal success extract of the heart of a guinea pig prepared in the same way); this mixture is left all night in the shaking machine, and then centrifuged. The decanted liquid remains clear and serves as a mother solution which can be kept on ice. To prepare for the reaction, place in a series of test tubes 0.25, 0.15, 0.10, 0.05, 0.025, 0.015 c. c. of the mother solution, and normal salt solution to make 1 c. c. in each tube. Control with a tube containing 1 c. c. of normal salt solution. To each of these seven tubes add 1 c. c. of 1-10 guinea pig serum, then 0.2 c. c. of inactive human serum. Place the tubes in the incubator at 37 degrees for thirty minutes, and at the end of that time add to each tube 1 c. c. of the suspension of sheep corpuscles and replace in the incubator for two hours. As each tube contains 1 c. c. it is only necessary to see in which tubes the contents are dissolved, to know the correct dilution of the organic extract: 1-4, 1-7, 1-10, 1-20, 1-40, 1-70. The liquid ought to remain clear in the control tube; if not the guinea pig serum is not fresh, or the human serum contains fats. Let us suppose that in the preceding experiment the contents of the three first tubes were not dissolved. The necessary dilution for serum diagnosis would be 1 c. c. of 1-20. The test should be then repeated with 1-10, 1-20, 1-30, and the serums of several subjects healthy and syphilitic to be certain of the correct dilution.

Serum of the patient. This is obtained by bleeding or with a hollow needle from the forearm, after constricting the upper arm with a band. Separate the clot, centrifuge, draw off the serum, and inactivate.

The reagents being prepared we now take four test tubes and fill in the following manner:

1. Tube principal.
Serum of patient..........................0.2 c. c.
Organic extract (standard)................1.0
Serum of guinea pig.......................1.0
2. Tube for control.
Serum of patient..........................0.2 c. c.
Normal salt solution......................1.0
Serum of guinea pig.......................1.0
3. Tube principal for comparison.
Normal serum ....0.2 c. c.
Organic extract (standard)................1.0
Serum of guinea pig.......................1.0
4. Tube to control comparison.
Normal serum ....0.2 c. c.
Normal salt solution......................1.0
Serum of guinea pig.......................1.0

After shaking the four tubes place for a half hour in the incubator at 37 degrees, then add 1 c. c. of the suspension of sheep corpuscles to each tube, and observe the course of the reaction in the incu-

bator. Generally the contents of tubes 2 and 4 dissolve within thirty minutes and the liquid becomes clear. Hemolysis appears soon in tube 3. When the blood of tube 1 dissolves almost in the same time as that of tube 3 the patient is healthy. If the contents of tube 1 do not dissolve, the patient is syphilitic. Some deviations from the normal course of the reaction may occur: (1) The contents of tube 1 may dissolve imperfectly. In this case repeat with tubes 1 and 2 with 0.15, 0.10 and 0.05 c. c. of the patient's serum seeking a combination so that the contents of tube 1 remain intact, and those of tube 2 dissolve entirely. (2) If this does not occur add to tubes 1 and 2, 0.1 to 0.2 c. c. of normal human serum. This is done at the same time that sheep corpuscles are added, but it can be done a quarter or a half hour after, and so it can be added when one is sure that the contents of tube 2 do not dissolve. In general we begin first with the addition of 0.1 c. c. of normal serum whose dissolving power is proved by the hemolysis established in tubes 3 and 4; if the dissolution is not perfect, try again with 0.2 c. c.. (3) The addition of 0.2 c. c. of normal human serum, and even of a larger amount is necessary when examining the serum of infants less than six months old.

In conclusion: Tubes 3 and 4 serve to prove, (a) that the presence of organic extract does not prevent the dissolution of corpuscles in the mixture; (b) that the serum of the guinea pig is not altered. Tube 2 serves to show, on one hand that the serum of the patient does not contain substances preventing the dissolution of sheep corpuscles and, on the other hand, that it contains sensitizing substances. It is essential to find for tube 2 the dose of normal human serum exactly dissolving; this ought always to be the same as that of tube 1.

(Dr. J. Bauer, Asst. in the pediatric clinic of the Academy of Medical Practice in Dusseldorf.)

COUNTY SOCIETIES
BUTTE COUNTY.

The regular monthly meeting of Butte County Medical Society met Tuesday evening, January 12, at the offices of Dr. P. E. Bullington; following members present: Drs. N. T. Enloe, P. F. Bullington, H. Morel, M. P. Stansbury, Ella F. Gatchell of Chico, and Dr. L. L. Thompson of Gridley.

Drs. H. Morel, Hal. M. Parker of Chico, and S. Iglick and Samuel A. Goldman of Orland, were admitted to membership.

A paper on pneumonia by Dr. P. F. Bullington was read by Dr. Thompson; the discussion was opened by Dr. M. Stansbury and participated in by other doctors.

Voted that the Society petition the Governor to reappoint Dr. N. K. Foster as Secretary of State Board of Health, and Dr. M. Stansbury was appointed a committee to obtain signatures to the petition.

ELLA F. GATCHELL, Secretary.

SACRAMENTO COUNTY.

The regular monthly meeting of the Sacramento Society was held on the evening of December 15, 1908, Dr. E. C. Turner being the host. Dr. D. A. Kellogg of Sacramento was unanimously elected a member. The society instructed its Secretary to write Dr. Grant Selfridge of San Francisco to attend its next meeting. The report of the Hospital Investigation Committee was received, and at a special meeting held one week later, was adopted. This report advised the employment of a pharmacist at the County Hospital, accommodations for more nurses and better accommodations and food for tubercular patients and a change from the present system to that of a resident superintendent with a visiting staff. A paper on "Typhoid Fever" was

read by Dr. Turner and discussed by members of the Society, lead by Drs. Twitchell and Jones, after which the meeting adjourned.

E. C. TURNER, Secretary.

SAN BERNARDINO COUNTY.

The San Bernardino County Medical Society at its regular meeting in December elected the following officers: W. P. Burke, President; Hoell Tyler, Vice-President; T. M. Blythe, Second Vice-President; Gayle G. Moseley, Secretary, and Wm. A. Taltaval, Treasurer.

The Society has taken up the post graduate course as outlined by the American Medical Association and is now meeting weekly instead of monthly as heretofore. The first meeting was well attended and the members very enthusiastic in regard to the course. The subject of the evening was Anatomy and Physiology of the Heart, which subjects were well presented by Drs. Power and Hill.

G. G. MOSELEY, Secretary.

SAN JOAQUIN COUNTY.

The regular monthly meeting of the San Joaquin County Medical Society met at the parlors of the Imperial Hotel as the guest of Dr. Hull, Friday evening, January 29, 1909, with the president, Dr. J. P. Hull, in the chair and the following members present: Drs. Nelson, Tower, Smythe, Tully, Latta, Gibbons, Hammond, Hull, Walker, Harry, Hoisholt, Taylor, Goodman, Knight, Friedberger, F. P. Clarke, A. E. Arthur, Blackman, Hopkins and M. Smyth.

The minutes of the previous meeting were read and approved. The committee on admissions reported favorably on the application of Dr. Wm. Friedberger, and he was declared elected. The name of Dr. S. N. Cross was proposed for membership and the application was referred to the committee on admission.

The question of life insurance examinations again came before the society and was followed by general discussion. The following motion was made and seconded, that Dr. I. B. Ladd be notified to appear at the next meeting of the society and prove to the society that he is complying with the rules of the society in charging $5 for all old line insurance examination, and in the event of his not doing so he is thereby expelled from the society. Carried.

A letter from the San Joaquin County Subdivision of the California Branch of the American National Red Cross Association was read, asking advice as to the best way of expending the $1000 they possessed in the crusade against tuberculosis. It was moved and carried that the chair appoint a committee to reply to same. The chair appointed Drs. Hoisholt, Latta and Harry.

A general discussion regarding the entertaining the coming meeting of the San Joaquin Valley Medical Society was entered into, and it was moved and seconded that the chair appoint a committee on entertainment, reception and banquet. Carried. The following committees were appointed:

Committee on Entertainment—Drs. Fred Clark, Hoisholt, Harry, Powell, Knight, H. Smyth and E. A. Arthur.

Committee on Banquet—Drs. Hammond, Powell, F. R. Clark, Walker and Langdon.

Committee on Reception—Drs. Ray, Harbert, Taggart, Powell, Johnson and Blackman.

Dr. Kerr was unable to reach the city, and his place was taken by Professor Fait, who gave a demonstration and explained the action of suggestion, which proved to be very interesting.

After refreshments served by Dr. Hull, the society adjourned.

SONOMA COUNTY.

The Sonoma County Medical Society met in Dr. Seawell's court-rooms, Dr. W. J. Kerr presiding. A short debate on "Fer Don," who is able to keep a troupe of negro minstrels and hire the biggest hall in the city, skating rink, for some two weeks or more. The question was, should we interfere. We finally concluded it would do no good.

We changed our regular meeting night to first Friday at 8 p. m. Dr. L. Lain, who has been treasurer several years, gave her report that the society had on hand $59.42. All bills were paid for 1908. The secretary, Dr. Mallory, reported an addition of five new members during 1908; two deaths; suspension for non-payment of dues, two; two transfers given, leaving 47 members. One of the members, who is aged, was made an honorary member. We love wisdom, and who is more useful to a medical society than a man who has spent a half century studying how to relieve and prevent suffering? An application for membership was made.

Dr. W. J. Kerr gave the paper of the evening—subject, "Typhoid Fever, Symptoms and Treatment." He gave the usual clinical and bacterial tests. The doctor has had eighteen cases of typhoid since July; no casualties. Treatment, if children, followed in a measure. Woodbridge believed in intestinal antiseptics, especially castor oil, enema of cold water at 75%, two to four quarts once or twice daily. His paper was a practical one and the speaker was highly complimented on this admirable paper.

Dr. W. C. Shipley always gave calomel and salines; believed in antiseptics; had had many cases in the mines; used sulphocarbolates. Dr. F. O. Pryor thought the routine of the great hospitals—no antiseptics, hydrotherapy, nourishing diet, good nursing —would be the best.

Dr. C. H. Thompson told us how prevalent was typhoid in Philadelphia in the sixties and spoke of the then treatment. He favored hydrotherapy.

Dr. Mallory favored initial dose of calomel followed by salt, antiseptics, Brant's Bath, high injection, castor oil, good feeding, digestives.

We adjourned to Campi Restaurant for a banquet. The next meeting will be held in Cloverdale, February 20, at 8 p. m.

Dr. H. J. Trachman will give the paper, "Diseases and Treatment of the Larynx." On discussion, W. C. Shipley, F. E. Sohler and S. Z. Peoples.

Citrus Fair at Cloverdale, February 19, 20, 22.

G. W. MALLORY, Secretary.

PUBLICATIONS.

Handbook of Diseases of the Skin. By Geo. Thos. Jackson.

This is the sixth edition of this interesting and convenient book. The subjects are arranged alphabetically and the important points of all skin diseases are well brought out. Very little notice is given to radio-therapy and photo-therapy, but in a book of this size a detailed description of electricity and the modern therapeutic lights would be out of place. Dr. Jackson has recently been made Professor of Dermatology at the College of Physicians and Surgeons, New York. We are glad to see that Dr. Jackson has the interest and enthusiasm to keep his book thoroughly revised, and it can be recommended as the most useful book on skin diseases for the busy physician. H. M.

The Practitioners' Visiting List for 1909. An invaluable pocket-sized book containing memoranda and data important for every physician, and ruled blanks for recording every detail of practice. The Weekly, Monthly and 30-Patient Perpetual contain 32 pages of data and 160 pages of classified blanks. The 60-Patient Perpetual consists of 256 pages of blanks alone. Each in one wallet-shaped book, bound in flexible leather, with flap and pocket, pencil and rubber, and calendar for two years. Price by mail, postpaid, to any address, $1.25. Thumb-letter index, 25 cents extra. De-

scriptive circular showing the several styles sent on request. Lea & Febiger, Publishers, Philadelphia and New York.

A Manual of Obstetrical Technic as Applied to Private Practice, With a Chapter on Abortion, Premature Labor, and Curettage. By Joseph Brown Cooke, M. D., Adjunct Professor of Obstetrics in the New York Polyclinic Medical School and Hospital; Lecturer on Obstetrics to the New York City Training School for Nurses; Surgeon to the New York Maternity Hospital, etc. Illustrated. Sixth Edition, Enlarged and Fully Revised. J. B. Lippincott Company, Philadelphia and London. 1908.

While the success of this little book certainly shows evidence on the part of many practitioners' of a keener appreciation of the importance of technical perfection to success in obstetrical practice, yet it is notorious that even now the mass of medical men engaged in general practice have been slow to avail themselves of the bacteriological principles underlying the prevention of infectious diseases. After all, the successful issue will depend in the majority of instances upon the efficiency of an aseptic technic in essence little differing from that employed by modern surgeons. It is, indeed, a sad commentary on the moral standards and intelligence of the majority of those engaged in the practice of obstetrics that they should show so few scruples so far as the fulfilment of their obligations to their patients and the medical profession is concerned. It is probably true that very many of these physicians have scarcely evolved beyond the midwife class, and it is also probably true that the number who have reached the standard of a modern well trained obstetrical nurse is still lamentably restricted, notwithstanding the very considerable amount of missionary work which has been done through the medium of medical and other periodicals. So far as this volume is concerned we have little to say except that after reading it we have put it aside cheerful in the belief of the soundness of its mission.   A. J. L.

CHANGE OF ADDRESS.

Holt, Wm. L., Aiken Blk., Santa Barbara.

Driscoll, Edw. P., from 1122 Turk St. to 2027 Polk St., S. F.

Doty, L. L., 620 N. Boyle Ave., Los Angeles, Cal.

Chaffee, F., from Parlier, Cal., to Yountville, Cal.

Lennon, Milton B., 135 Stockton St.

Day-Bew, L. B., from 1424 Gough St. to Phelan Bldg., S. F.

Pitcher, Josephine, Miramontz, Half Moon Bay, Cal.

Quinan, Clarence, from 2521 Broadway to 391 Sutter St.

Waggoner, Eugene L., from Fay Bldg., Los Angeles, to Wright & Callender Bldg., L. A.

Johnston, Wm. R., from 107½ Main St., Los Angeles, to 119 West 49th St., L. A.

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Cox, J. Emit, from Los Angeles, Cal., to Taylor Block, South Pasadena, Cal.

Cook, Christina A., from 901 Devisadero St. to 421 Baker St., S. F.

Banks, Wm. H., from Stirling City, Cal., to 136 Lexington Ave., New York (temporary).

Rosenthal, Adolph G., from 1107 Franklin St. to 162 Post St., S. F.

Wortmann, Heinrich, from German Hospital, S. F., to 1480 Church St., S. F.

Abrahamson, Milton, 240 Stockton St.

Bruman, Arthur Karr, German Hospital, S. F.

de Faria, J. B., from 1096 Clay St., S. F., to —?

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Sunde, P. H., from Johnson Bldg., Los Angeles, to Wright & Callender Bldg., Los Angeles.

Johnson, Milbank, from O. T. Johnson Bldg., Los Angeles, to Wright & Callender Bldg., L. A.

Whitlock, Thos. S., from 631—21st St., San Diego, to 1027—5th St., San Diego, Cal.

Oldham, Jno. Y., from Ocean Park, Cal., to Grant Bldg., Los Angeles, Cal.

Whitlock, W. G., from Berkeley, Cal., to Sisters' Hospital, Los Angeles.

Wislocki, Eugene John, from 550 E St., San Jose, to 1st and Fountain Sts., San Jose.

Bowen, Amy G., Monte Vida Sanitarium, Alum Rock, San Jose, Cal.

Thomas, Benj., Porter Bldg., San Jose, Cal.

Allen, Frances M., from San Diego to Stirling City, Butte Co., Cal.

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Parker, Hal M., Chico, Cal.

Iglick, Samuel, Orland, Cal.

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Newman, Samuel, Santa Barbara.

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